

---

# TRAFFIC IMPACT ANALYSIS REPORT PULELEHUA DEVELOPMENT

Lahaina, Maui, Hawaii

## FINAL DRAFT

November 15, 2017

Prepared for:

Maui Oceanview LP  
2525 McKinney Ave., Suite B  
Dallas, Texas 75201



*Austin, Tsutsumi & Associates, Inc.*

Civil Engineers • Surveyors

501 Sumner Street, Suite 521

Honolulu, Hawaii 96817-5031

Telephone: (808) 533-3646

Facsimile: (808) 526-1267

E-mail: [atahnl@atahawaii.com](mailto:atahnl@atahawaii.com)

Honolulu • Wailuku • Hilo, Hawaii

---

**TRAFFIC IMPACT ANALYSIS REPORT**  
**PULELEHUA DEVELOPMENT**

Lahaina, Maui, Hawaii

**FINAL DRAFT**

Prepared for  
Maui Oceanview LP

Prepared by  
**Austin, Tsutsumi & Associates, Inc.**  
Civil Engineers • Surveyors  
Honolulu • Wailuku • Hilo, Hawai'i

November 15, 2017



TERRANCE S. ARASHIRO, P.E.

ADRIENNE W.L.H. WONG, P.E., LEED AP

DEANNA M.R. HAYASHI, P.E.

PAUL K. ARITA, P.E.

ERIK S. KANESHIRO, L.P.L.S., LEED AP

MATT K. NAKAMOTO, P.E.

GARRETT K. TOKUOKA, P.E.

ADRIENNE W.L.H. WONG, P.E., LEED AP

Maui Branch Manager

## PULELEHUA DEVELOPMENT

### EXECUTIVE SUMMARY

Maui Oceanview LP is proposing to develop the Pulelehua development (hereinafter referred to as "Project") in Lahaina, Maui. The Project will be bounded by Honoapiilani Highway to the west, Kapalua Airport to the east and proposes to develop approximately 304.255 acres of land.

#### Project Description

The Project will provide 898 multi-family (MF) residential units, 2 single-family residential lots (for future residential development), an elementary school, a 10-acre park and two (2) retail centers, totaling 70,000 square feet (SF). In addition, a trail will be constructed just east and parallel to Honoapiilani Highway that will provide bike and pedestrian access to link the Project's development north and south of Mahinahina Gulch. The Project will be constructed in six (6) phases, but for purposes of this TIAR, will be analyzed as four (4) scenarios. See Table ES-1 for the land use breakdown and vehicle trips generated by each of the four (4) Project Scenarios.

Although it is not part of this TIAR, the Project envisions future expansion at the north end of the Project site (currently identified as 2 single-family residential lots) with an additional 302 residential units, bringing the total residential unit count to 1,200 residential units. Future traffic analysis and roadway mitigation measures will be assessed at a later date.

Table ES.1: Pulelehua Land Use Summary

| Buildout Year    | Project Scenario | Project Land Use                              | New Project Trips<br>AM(PM)[Sat MD] |
|------------------|------------------|-----------------------------------------------|-------------------------------------|
| Future Year 2022 | Scenario 1       | - 240 Residential Units                       | 89(125)[106]                        |
|                  | Scenario 2       | - 240 Residential Units<br>- 70,000 SF Retail | 210(332)[666]                       |
|                  | Scenario 3       | - 420 Residential Units<br>- 10-acre Park     | 168(255)[257]                       |
| Future Year 2027 | Scenario 4       | - Elementary School<br>(assumed 750-students) | 312(101)[0]                         |

Notes:

SF = Square feet



Scenario 1 – Project's initial residential phase, north of Akahele Street. Direct access will be provided by two (2) new Project roadways, Road A and Road C, bisecting Akahele Street.

Scenario 2 - Residential and retail uses south of Akahele Street. Primary access to residential & retail components will be provided by Akahele Street. The north retail area will also be serviced by a proposed right-in, right-out (RIRO) access via Honoapiilani Highway.

Based on the developer forecast absorption for the retail component, approximately 15,000 SF of retail space will be occupied by Year 2022, with subsequent occupancy occurring at a pace of 5,000 SF of retail space every 2 years thereafter. Therefore, full build-out and occupancy will likely occur well beyond Year 2022, but was assumed to be fully built out by Year 2022 for this TIAR

Scenario 3 – Remaining residential spaces both north and south of Mahinahina Gulch and 10-acre park. Access will be provided by Akahele Street and a new Project roadway, Road J, intersecting Honoapiilani Highway south of Mahinahina Gulch.

Scenario 4 – Future DOE elementary school site, with access to be provided by Akahele Street. Since the development of the school is not in the direct controller of the Pulelehua development, the timeframe for this school has yet to be determined. For purposes of this TIAR, a forecast build-out of 2027 was assumed for the TIAR.

### **Existing and Base Year Traffic Analysis Without the Project**

This TIAR evaluated existing conditions along Honoapiilani Highway at 11 major signalized intersections from Napilihau Street to Keawe Street. Existing traffic counts were taken in November and December 2016 during the weekday AM/PM and Saturday midday (MD) peak hours of traffic. Various intersections along the highway operate with either fixed coordinated signal timing plans or uncoordinated plans with lengthy through volume green times. As a result, numerous mainline left-turn movements and minor street approaches at various study intersections operate at LOS E/F conditions due to lengthy delays from the signal timing plans that favor the through movements along Honoapiilani Highway. Signal coordination is currently provided along Honoapiilani Highway between Leialii Parkway to Keawe Street.

As part of this TIAR, traffic was forecast to years 2022 and 2027 without the Project to constitute the Base Year (no build) scenarios. These buildout years coincide with the anticipated build-out years of the Project's Scenarios 1-4. By Base Year 2022 and 2027, numerous planned roadway improvements and nearby developments are anticipated to be completed within the Project study area and were included in the TIAR. By Base Year 2022 without the Project, traffic at the study intersections along Honoapiilani Highway is estimated to increase overall by approximately 10-30% on various parts of the corridor during the AM, PM and WE peak hours of traffic. All study intersections are forecast to operate similar to existing conditions. Overall intersection delays generally increased by only 1-5 seconds at most study intersections.

Table ES-2 summarizes the roadway improvements that are anticipated to occur by Base Years 2022 and 2027 without the Project.

Table ES.2: Roadway Improvements Summary WITHOUT Pulelehua

| Buildout Year                                     | Project Scenario | Intersection                                                   | Roadway Improvement                                                                                                                                                                                                                                                                                                                        |
|---------------------------------------------------|------------------|----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Planned Roadway Improvements<br>(Without Project) | --               | Lahaina Bypass Road                                            | <u>Lahaina Bypass Road (LBR) Phase 1B-2</u><br>- Extend LBR from Hokiokio Place to its southern terminus with Honoapiilani Highway<br>- Reroute all northbound traffic to use LBR instead of Honoapiilani Highway<br>- Signalize and modify intersection laneage along LBR at its intersections with Kai Hele Ku Street and Hokiokio Place |
|                                                   |                  | Honoapiilani Highway/<br>Keawe Street/<br>Lahaina Cannery Mall | - Construct an additional southbound left-turn lane, resulting in dual southbound left-turn lanes<br>- Optimize signal timing plans along the coordinated corridor from Leialii Parkway to Keawe Street                                                                                                                                    |
|                                                   |                  | Honoapiilani Highway/<br>Napili Hau Street                     | - Construct an exclusive right-turn lane on the northbound Honoapiilani Highway approach<br>- Construct an exclusive left-turn lane and shared through/right-turn lane on the westbound Napili Hau Street approach                                                                                                                         |
| Base Year 2022<br>(Without Project)               | --               | Honoapiilani Highway/<br>Kaanapali Parkway/<br>Halelo Street   | - Construct an additional eastbound left-turn lane, resulting in a dedicated left-turn lane, shared left-turn/through lane and two (2) dedicated right-turn lanes                                                                                                                                                                          |
| Base Year 2027<br>(Without Project)               | --               | --                                                             | - No roadway improvements recommended                                                                                                                                                                                                                                                                                                      |



### **Future Year Traffic Analysis With the Project**

As mentioned above, Table ES-1 summarizes the Project's land use breakdown and vehicle trips generated by each of the four (4) Project Scenarios. In total, the Project's Scenarios 1-4 will generate 779(813)[1,029] new external vehicular trips during the AM(PM)[Sat MD] peak hours, respectively. The Project will increase both regional traffic and local (those providing direct access to the Project) traffic along Honoapiilani Highway with the following traffic percentile increases:

- Scenario 1 – Increase overall regional traffic by less than 5% and local traffic by less than 10% from Base Year 2022 conditions.
- Scenario 2 – Increase overall regional traffic by 5-15% and local traffic by 10-40% from Base Year 2022 conditions.
- Scenario 3 – Increase overall regional traffic by 5-20% and local traffic by 10-50% from Base Year 2022 conditions.
- Scenario 4 – With a new Elementary School in the Project site, many students will transfer to this site from the Kaanapali, Honokowai, Kahana, Napili and Kapalua regions. Trips generated by the new elementary school were rerouted from existing traffic along Honoapiilani Highway to the new site. As a result, the majority of traffic increases consisted of turning movement traffic into and out of Akahahele Street on the east leg of its intersection with Honoapiilani Highway. Traffic reductions to various through movements along the highway were a result of the reroute.

Table ES-3 summarizes the roadway improvements that are anticipated to occur by Future Years 2022 and 2027 with the Project.

Table ES.3: Roadway Improvements Summary WITH Pulelehua

| Buildout Year                      | Project Scenario | Intersection                                                                   | Roadway Improvement                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------|------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Future Year 2022<br>(With Project) | Scenario 1       | --                                                                             | - No additional roadway improvements recommended                                                                                                                                                                                                                                                                                                                                                       |
|                                    | Scenario 2       | Honoapiilani Highway/<br>Akahele Street <sup>1</sup>                           | - Optimize signal timing plan<br>- Northbound left-turn lane → Lengthen lane to provide at least 275 feet of storage space<br>- Southbound left-turn lane → Lengthen lane to provide at least 275 feet of storage space<br>- Westbound left-turn lane → Lengthen lane to provide at least 300 feet of storage space                                                                                    |
|                                    |                  | Honoapiilani Highway/<br>Project Retail Area North<br>RIRO Access <sup>1</sup> | - Northbound right-turn lane → Provide a new right-turn with at least a 100 feet of storage space.                                                                                                                                                                                                                                                                                                     |
|                                    |                  | Akahele Street @<br>Road A & Road C<br>intersections                           | - Consider installing left-turn storage lanes along Akahele Street at Road A and Road C intersections                                                                                                                                                                                                                                                                                                  |
|                                    | Scenario 3       | Honoapiilani Highway/<br>Road J (Project South<br>Access) <sup>1</sup>         | - Provide a median refuge lane along Honoapiilani Highway for westbound left-turn vehicles.<br>- Northbound right-turn lane → Provide a new right-turn with at least a 100 feet of storage space<br>- Southbound left-turn lane → Provide a new left-turn with at least a 100 feet of storage space<br>- Westbound left-turn lane → Provide a new right-turn with at least a 100 feet of storage space |
| Future Year 2027<br>(With Project) | Scenario 4       | Honoapiilani Highway/<br>Kapunakea Street                                      | - Consider restriping to provide exclusive eastbound left-turn lane and shared through/right-turn lane.                                                                                                                                                                                                                                                                                                |

Notes:

1. Right-turn and left-turn lane lengths show required minimum storage space only. Additional taper length and/or deceleration length to be provided/verified upon intersection design. Based on AASHTO Green Book, 425 feet is recommended to accommodate full deceleration length with a design speed of 50 mph.



## TABLE OF CONTENTS

|                                                                  | <b><u>Page</u></b> |
|------------------------------------------------------------------|--------------------|
| 1. INTRODUCTION.....                                             | 1-4                |
| 1.1 Location.....                                                | 1                  |
| 1.2 Project Description .....                                    | 1                  |
| 2. METHODOLOGY .....                                             | 5                  |
| 2.1 Study Methodology.....                                       | 5                  |
| 2.2 Intersection Analysis .....                                  | 5                  |
| 3. EXISTING CONDITIONS.....                                      | 6-13               |
| 3.1 Roadway System .....                                         | 6                  |
| 3.2 Existing Traffic Volumes.....                                | 7                  |
| 3.3 Existing Traffic Conditions Observations and Analysis .....  | 8                  |
| 3.3.1 Regional Analysis .....                                    | 8                  |
| 3.3.2 Existing Intersection Analysis .....                       | 8                  |
| 4. BASE YEAR TRAFFIC CONDITIONS .....                            | 14-34              |
| 4.1 Defacto Growth Rate .....                                    | 14                 |
| 4.2 Traffic Forecasts for Known Developments.....                | 14                 |
| 4.2.1 Background Projects.....                                   | 14                 |
| 4.2.2 Trip Generation.....                                       | 15                 |
| 4.3 Planned Roadway Improvements .....                           | 19                 |
| 4.4 Base Year 2022 Analysis .....                                | 19                 |
| 4.4.1 Base Year 2022 Intersection Analysis .....                 | 20                 |
| 4.4.2 Base Year 2022 With Mitigation Intersection Analysis ..... | 20                 |
| 4.5 Base Year 2027 Analysis .....                                | 28                 |
| 4.5.1 Base Year 2027 Intersection Analysis .....                 | 28                 |





## TABLE OF CONTENTS Cont'd

|                                                              | <b><u>Page</u></b> |
|--------------------------------------------------------------|--------------------|
| 5. FUTURE YEAR SCENARIOS.....                                | 35-76              |
| 5.1 Background .....                                         | 35                 |
| 5.1.1 Travel Demand Estimations.....                         | 36                 |
| 5.1.2 Trip Generation.....                                   | 36                 |
| 5.1.3 Trip Distribution and Assignment.....                  | 36                 |
| 5.2 Future Year 2022 Scenario 1 Analysis.....                | 39                 |
| 5.2.1 Future Year 2022 Scenario 1 Intersection Analysis..... | 39                 |
| 5.3 Future Year 2022 Scenario 2 Analysis.....                | 48                 |
| 5.3.1 Future Year 2022 Scenario 2 Intersection Analysis..... | 48                 |
| 5.4 Future Year 2022 Scenario 3 Analysis.....                | 59                 |
| 5.4.1 Future Year 2022 Scenario 3 Intersection Analysis..... | 59                 |
| 5.5 Future Year 2027 Scenario 4 Analysis.....                | 68                 |
| 5.5.1 Future Year 2027 Scenario 4 Intersection Analysis..... | 68                 |
| 6. CONCLUSIONS.....                                          | 77-82              |
| 6.1 Existing Conditions.....                                 | 78                 |
| 6.2 Base Year 2022.....                                      | 78                 |
| 6.3 Base Year 2022 With Mitigation .....                     | 78                 |
| 6.4 Base Year 2027.....                                      | 79                 |
| 6.5 Future Year 2022 Scenario 1 .....                        | 79                 |
| 6.6 Future Year 2022 Scenario 2 .....                        | 80                 |
| 6.7 Future Year 2022 Scenario 3 .....                        | 80                 |
| 6.8 Future Year 2027 Scenario 4 .....                        | 81                 |



## TABLE OF CONTENTS Cont'd

|                                                    | <b><u>Page</u></b> |
|----------------------------------------------------|--------------------|
| 7. RECOMMENDATIONS.....                            | 83-84              |
| 7.1    Planned Roadway Improvements .....          | 83                 |
| 7.2    Base Year 2022 Mitigation .....             | 83                 |
| 7.3    Future Year 2022 Scenario 2 Mitigation..... | 83                 |
| 7.4    Future Year 2022 Scenario 3 Mitigation..... | 84                 |
| 7.5    Future Year 2027 Scenario 4 Mitigation..... | 84                 |
| 8. REFERENCES.....                                 | 85                 |



## TABLE OF CONTENTS Cont'd

|                                                                                                                             | <b><u>Page</u></b> |
|-----------------------------------------------------------------------------------------------------------------------------|--------------------|
| <b>TABLES</b>                                                                                                               |                    |
| 3.1 EXISTING CONDITIONS LEVEL OF SERVICE SUMMARY .....                                                                      | 12                 |
| 4.1 BACKGROUND PROJECTS TRIP GENERATION RATES.....                                                                          | 17                 |
| 4.2 BACKGROUND PROJCTETS TRIP GENERATION.....                                                                               | 18                 |
| 4.3 EXISTING CONDITIONS, BASE YEAR 2022 AND BASE YEAR 2022 WITH<br>MITIGATION LEVEL OF SERVICE SUMMARY .....                | 25                 |
| 4.3 BASE YEAR 2022 WITH MITIGATION AND BASE YEAR 2027 LEVEL OF<br>SERVICE SUMMARY .....                                     | 31                 |
| 5.1 TRIP GENERATION RATES.....                                                                                              | 37                 |
| 5.2 PROJECT-GENERATED TRIPS.....                                                                                            | 38                 |
| 5.3 FUTURE YEAR 2022 (SCENARIO 1) LEFT-TURN STORAGE LANE<br>LENGTH CALCULATIONS .....                                       | 44                 |
| 5.4 BASE YEAR 2022 WITH MITIGATION AND FUTURE YEAR 2022<br>SCENARIO 1 LEVEL OF SERVICE SUMMARY .....                        | 45                 |
| 5.5 FUTURE YEAR 2027 (FULL PULELEHUA BUILD-OUT WITH SCHOOL)<br>LEFT-TURN STORAGE LANE LENGTH CALCULATIONS .....             | 55                 |
| 5.6 BASE YEAR 2022 WITH MITIGATION, FUTURE YEAR 2022 SCENARIO 1<br>AND FUTURE YEAR 2022 SCENARIO 2 LEVEL OF SERVICE SUMMARY | 56                 |
| 5.7 BASE YEAR 2022, FUTURE YEAR 2022 SCENARIO 2 AND FUTURE<br>YEAR 2022 SCENARIO 3 LEVEL OF SERVICE SUMMARY.....            | 65                 |
| 5.8 BASE YEAR 2027, FUTURE YEAR 2022 SCENARIO 3 AND FUTURE<br>YEAR 2027 SCENARIO 4 LEVEL OF SERVICE SUMMARY.....            | 74                 |
| <b>FIGURES</b>                                                                                                              |                    |
| 1.1 LOCATION MAP .....                                                                                                      | 3                  |
| 1.2 SITE PLAN .....                                                                                                         | 4                  |
| 3.1 EXISTING LANE CONFIGURATION, VOLUMES AND LOS.....                                                                       | 10                 |
| 4.1 BACKGROUND PROJECTS.....                                                                                                | 16                 |



## TABLE OF CONTENTS Cont'd

|                                                                                            | <b><u>Page</u></b> |
|--------------------------------------------------------------------------------------------|--------------------|
| 4.2 BASE YEAR 2022 LANE CONFIGURATION, VOLUMES AND LOS .....                               | 21                 |
| 4.3 BASE YEAR 2022 WITH MITIGATION LANE CONFIGURATION,<br>VOLUMES AND LOS .....            | 23                 |
| 4.4 BASE YEAR 2027 LANE CONFIGURATION, VOLUMES AND LOS .....                               | 29                 |
| 5.1 YEAR 2022 SCENARIO 1 PROJECT-GENERATED TRAFFIC .....                                   | 40                 |
| 5.2 FUTURE YEAR 2022 SCENARIO 1 LANE CONFIGURATION, VOLUMES<br>AND LOS.....                | 42                 |
| 5.3 YEAR 2022 SCENARIO 2 PROJECT-GENERATED TRAFFIC .....                                   | 50                 |
| 5.4 FUTURE YEAR 2022 SCENARIO 2 LANE CONFIGURATION, VOLUMES<br>AND LOS.....                | 52                 |
| 5.5 FUTURE YEAR 2022 SCENARIO 2 AKAHELE STREET LANE<br>CONFIGURATION, VOLUMES AND LOS..... | 54                 |
| 5.6 YEAR 2022 SCENARIO 3 PROJECT-GENERATED TRAFFIC .....                                   | 61                 |
| 5.7 FUTURE YEAR 2022 SCENARIO 3 LANE CONFIGURATION, VOLUMES<br>AND LOS.....                | 63                 |
| 5.8 YEAR 2027 SCENARIO 4 PROJECT-GENERATED TRAFFIC .....                                   | 70                 |
| 5.9 FUTURE YEAR 2027 SCENARIO 4 LANE CONFIGURATION, VOLUMES<br>AND LOS.....                | 72                 |



## TABLE OF CONTENTS Cont'd

### APPENDICES

- A. TRAFFIC COUNT DATA
- B. LEVEL OF SERVICE CRITERIA
- C. LEVEL OF SERVICE CALCULATIONS
- D. ROADWAY IMPROVEMENTS PLAN
- E. TRAFFIC SIGNAL WARRANT



TERRANCE S. ARASHIRO, P.E.

ADRIENNE W.L.H. WONG, P.E., LEED AP

DEANNA M.R. HAYASHI, P.E.

PAUL K. ARITA, P.E.

ERIK S. KANESHIRO, L.P.L.S., LEED AP

MATT K. NAKAMOTO, P.E.

GARRETT K. TOKUOKA, P.E.

ADRIENNE W.L.H. WONG, P.E., LEED AP

Maui Branch Manager

## TRAFFIC IMPACT ANALYSIS REPORT

### PULELEHUA DEVELOPMENT

#### Lahaina, Maui, Hawaii

## 1. INTRODUCTION

This report documents the findings of a traffic study conducted by Austin, Tsutsumi & Associates, Inc. (ATA) to evaluate the potential traffic impacts resulting from the proposed Pulelehua Development (hereinafter referred to as the "Project").

### 1.1 Location

The Project is located upon approximately 304.255 acres of undeveloped land in Lahaina on the island of Maui. The Project will be bounded by Honoapiilani Highway to the west and the Kapalua Airport to the east. See Figure 1.1 for the Project location.

### 1.2 Project Description

A Traffic Impact Analysis Report (TIAR) was completed for the Project in October 2008 and updated in May 2009. Since 2009, the Project's site plan has undergone some modifications and currently proposes to develop approximately 304.255 acres of land to provide 898 multi-family (MF) residential units, 2 single-family residential lots (for future residential development), an elementary school, a 10-acre park and two (2) retail centers, totaling 70,000 square feet (SF). In addition, a trail will be constructed just east and parallel to Honoapiilani Highway that will provide bike and pedestrian access to link the Project's development north and south of Mahinahina Gulch. The Project will be constructed in six (6) phases, but for purposes of this TIAR, will be analyzed as four (4) scenarios.

Although it is not part of this TIAR, the Project envisions future expansion at the north end of the Project site (currently identified as 2 single-family residential lots) with an additional 302 residential units, bringing the total residential unit count to 1,200 residential units. Future traffic analysis and roadway mitigation measures will be assessed at a later date.

Figure 1.2 shows the Project site plan.

Scenario 1 – Develop Phase 1 with a build-out of early 2022 that includes the following:



- 240 MF residential units north of Akahele Street, with direct access provided by two (2) new Project roadways, Road A and Road C, bisecting Akahele Street.

Scenario 2 - Develop Phase 2 and Retail component with a build-out of early 2022 that includes the following:

- 240 MF residential units south of Akahele Street with direct access provided by Road A and Road C.
- Retail Area North consisting of 50,000 square feet (SF) of space located on the northeast corner of the Honoapiilani Highway/Akahele Street intersection.
- Retail Area South consisting of 20,000 SF of space located adjacent to Retail Area North on the southeast corner of the Honoapiilani Highway/Akahele Street intersection.
  - o Access to Retail Area North and South will be provided by Road A. Retail Area North will also be serviced by a right-in, right-out (RIRO) access via Honoapiilani Highway.
  - o Based on the developer forecast absorption for the Retail Area North and South component, approximately 15,000 SF of retail space will be occupied by Year 2022, with subsequent occupancy occurring at a pace of 5,000 SF of retail space every 2 years thereafter. Therefore, full build-out and occupancy of Retail Areas North and South will likely occur well beyond Year 2022, but was assumed to be fully built out by Year 2022 for this TIAR.

Scenario 3 – Develop Phases 3-5 with a build-out of late 2022 that include the following:

- 100 MF residential units (Phase 3) south of Akahele Street, with access provided by Road C.
- 318 MF residential units (Phase 3 and Phase 4) south of Mahinahina Gulch, with access provided by a new Project roadway, Road J, intersecting Honoapiilani Highway south of Mahinahina Gulch.
- 2 single-family residential lots north of Akahele Street, with access provided by Road A and Road C.
- 10-acre park with two (2) practice fields south of Mahinahina Gulch, with access provided by Road J.

Scenario 4 – A future elementary school, to be planned/developed by the Department of Education (DOE). Since the development of the school is not in the direct controller of the Pulelehua development, the timeframe for this school has yet to be determined. For purposes of this TIAR, a forecast build-out of 2027 was assumed for the TIAR.

- 750-student elementary school, with access provided by Road A.







PULELEHUA


 AUSTIN, TSUTSUMI & ASSOCIATES, INC.  
 ENGINEERS, SURVEYORS

HONOLULU, HAWAII

SITE PLAN

FIGURE

1.2



## 2. METHODOLOGY

### 2.1 Study Methodology

This study will address the following:

- Assess existing traffic operating conditions at key intersections during the weekday morning (AM) and afternoon (PM) and Saturday midday (WE) peak hours of traffic within the study area.
- Traffic projections for Base Year 2022 and 2027 (without the Project) including traffic generated by other known developments in the vicinity of the Project in addition to an ambient growth rate. These other known developments are projects that are currently under construction or known new/future developments that are anticipated to affect traffic demand and operations within the study area.
- Trip generation and traffic assignment characteristics for the proposed Project.
- Traffic projections for Future Year 2022 (with the Project Scenario 1, 2 and 3) and Future Year 2027 (with the Project Scenario 4), which includes Base Year traffic volumes in addition to traffic volumes generated by the four (4) Project scenarios.
- Recommendations for Base Year and Future Year roadway improvements or other mitigative measures, as appropriate, to reduce or eliminate the adverse impacts resulting from traffic generated by known developments in the region or the Project.

### 2.2 Intersection Analysis

Level of Service (LOS) is a qualitative measure used to describe the conditions of traffic flow at intersections, with values ranging from free-flow conditions at LOS A to congested conditions at LOS F. The Highway Capacity Manual (HCM), dated 2010, includes methods for calculating volume to capacity ratios, delays, and corresponding Levels of Service that were utilized in this study. LOS definitions for signalized and unsignalized intersections are provided in Appendix B.

Analyses for the study intersections were performed using the traffic analysis software Synchro, which is able to prepare reports based on the methodologies described in the HCM. These reports contain control delay results as based on intersection lane geometry, signal timing, and hourly traffic volumes. Based on the vehicular delay at each intersection, a LOS is assigned to each approach and intersection movement as a qualitative measure of performance. These results, as confirmed or refined by field observations, constitute the technical analysis that will form the basis of the recommendations outlined in this report.



### 3. EXISTING CONDITIONS

#### 3.1 Roadway System

The following are brief descriptions of the existing roadways in the vicinity of the Project:

Honoapiilani Highway – is a State highway that provides regional connection for the majority of West Maui. Honoapiilani Highway begins in Wailuku where it transitions from South High Street and continues southward toward Maalaea. The highway borders the coastline as it curves back around West Maui and northward again toward Kapalua, where it transitions into Kahekili Highway near Honokohau Bay. In the vicinity of the Project, Honoapiilani Highway is generally a two-way, two-lane undivided road with a posted speed limit of 45 miles per hour (mph) in the vicinity of the Project.

Napili Hau Street – is a roadway that provides access to businesses and residential areas. The roadway begins to the northwest at its intersection with Lower Honoapiilani Road and travels southeast to Honoapiilani Highway before terminating to the southwest at Maui Preparatory Academy. In the vicinity of the Project, Napili Hau Street is generally a two-way, one-lane undivided road with a posted speed limit of 20 mph.

Hoohui Road – is a roadway that provides access to businesses and residential areas. The roadway begins to the west at its intersection with Lower Honoapiilani Road and terminates to the east at its intersection with Kahana Ridge Drive. West of its intersection with Honoapiilani Highway, Hoohui Road is a two-way, one-lane undivided road with a speed limit of 20 mph. East of its intersection with Honoapiilani Highway, Hoohui Road is a two-way, two-lane undivided road with a posted speed limit of 25 mph.

Akahele Street – is a roadway that provides access to residential areas and the Kapalua Airport. The roadway begins to the west at its intersection with Lower Honoapiilani Road and terminates to the east at the Kapalua Airport. In the vicinity of the Project, Akahele Street is a two-way, one-lane undivided road with a posted speed limit of 30 mph.

Lower Honoapiilani Road – is a County collector that provides access to hotels, businesses and residential areas. The roadway begins at its intersection with Honoapiilani Highway and runs north parallel to the highway and the coast before terminating at its intersection with Office Road near the Kapalua Golf Course. In the vicinity of the Project, Lower Honoapiilani Road is generally a two-way, one-lane undivided road with a posted speed limit of 20 mph.

Halawai Drive/Kai Malina Parkway – is a roadway that provides access to various businesses and hotels. Halawai Drive is a roadway east of Honoapiilani Highway and Kai Malina Parkway is a roadway west of the highway, servicing Honua Kai Resort and Spa.

Puukolii Road – is a roadway that provides access to residential areas. The roadway begins to the west at its intersection with Honoapiilani Highway and terminates to the southeast at its intersection with Oil Road. In the vicinity of the Project, Puukolii Road is a two-way, one-lane undivided road with a posted speed limit of 30 mph.

Kai Ala Drive – is a County roadway that begins to the east at its intersection with Honoapiilani Highway and travels west to provide access to Kahekili Beach Park and several hotels. In the vicinity of the Project, Kai Ala Drive is a two-way, one-lane divided road.



Kaanapali Parkway – is a roadway that provides access to various hotels and businesses. The roadway begins to the east at its intersection with Honoapiilani Highway and travels northwest before terminating near the Royal Kaanapali Golf Course. In the vicinity of the Project, Kaanapali Parkway is a two-way, two-lane divided road.

Halelo Street – is a roadway that provides access to residential areas. The roadway begins to the west at its intersection with Honoapiilani Highway and travels southeast before terminating. In the vicinity of the Project, Halelo Street is a two-way, one-lane undivided road.

Leialii Parkway – is a collector road that provides access to residential areas, civic center and the post office. The roadway begins to the west at its intersection with Honoapiilani Highway and terminates to the east. In the vicinity of the Project, Leialii Parkway is a two-way, one-lane undivided road with a posted speed limit of 25 mph.

Fleming Road – is a roadway that provides access to residential areas. The roadway begins to the west at its intersection with Honoapiilani Highway and terminates to the east. In the vicinity of the Project, Fleming Road is a two-way, one-lane undivided road with a posted speed limit of 20 mph.

Front Street – is a County collector road that provides access to businesses and residential areas. The roadway begins to the south at its intersection with Honoapiilani Highway just north of Hokiokio Place. The road then travels north parallel to the coast and the highway before reconnecting with Honoapiilani Highway at Fleming Road. In the vicinity of the Project, Front Street is a two-way, one-lane undivided road with a posted speed limit of 20 mph.

Kapunakea Road – is a roadway that provides access to businesses and residential areas. The roadway begins to the west at its intersection with Front Street and terminates to the east past its intersection with Honoapiilani Highway. West of its intersection with Honoapiilani Highway, Kapunakea Road is a two-way, two-lane undivided roadway. East of its intersection with Honoapiilani Highway, Kapunakea Road is a two-way, one-lane undivided roadway.

Keawe Street – is a County collector road that provides access to businesses and residential areas. The roadway begins to the west at its intersection with Honoapiilani Highway and terminates to the east at its intersection with Lahaina Bypass Road. In the vicinity of the Project, Keawe Street is a two-way, two-lane divided roadway.

### **3.2 Existing Traffic Volumes**

The AM peak hour turning movement data utilized in this report were collected on December 1, 2016 and December 7, 2016. The PM peak hour turning movement data were collected on November 30, 2016 and December 6, 2016. The WE hourly turning movement data were collected on December 10, 2016. Based on the proximity to the proposed Project site, the following intersections were studied in the existing conditions scenario.

- [1] Honoapiilani Highway/Napili Hau Street (signalized)
- [2] Honoapiilani Highway/Hoohui Road (signalized)
- [3] Honoapiilani Highway/Akahele Street (signalized)
- [4] Honoapiilani Highway/Lower Honoapiilani Road (signalized)
- [5] Honoapiilani Highway/Halawai Drive/Kai Malina Parkway (signalized)



- [6] Honoapiilani Highway/Puukoolii Road/Kai Ala Drive (signalized)
- [7] Honoapiilani Highway/Kaanapali Parkway/Halelo Street (signalized)
- [8] Honoapiilani Highway/Leialii Parkway (signalized)
- [9] Honoapiilani Highway/Fleming Road/Front Street (signalized)
- [10] Honoapiilani Highway/Kapunakea Road (signalized)
- [11] Honoapiilani Highway/Keawe Street/Lahaina Cannery Mall (signalized)

Based on the count data, it was determined that the weekday AM peak hour of traffic occurs between 7:15 AM and 8:15 AM, the weekday PM peak hour of traffic occurs between 3:45 PM and 4:45 PM, and the Saturday WE peak hour of traffic occurs between 11:30 AM and 12:30 PM. The turning movement count data is included in Appendix A.

### **3.3 Existing Traffic Conditions Observations and Analysis**

#### **3.3.1 Regional Analysis**

Honoapiilani Highway generally operates as a two (2) lane highway from Napili Hau Street to Lower Honoapiilani Road and continues south as a four (4) lane highway from Lower Honoapiilani Road to beyond Keawe Street. As discussed in Section 3.3.2 below, various intersections along the highway operate with either fixed coordinated signal timing plans or uncoordinated plans with lengthy through volume green times. As a result, numerous mainline left-turn movements and minor street approaches at various study intersections operate at LOS E/F conditions due to lengthy delays from the signal timing plans that favor the through movements along Honoapiilani Highway. However, with the exception of the southbound left-turn movement at the Honoapiilani Highway/Keawe Street intersection described below, all vehicular movements at each study intersection operate adequately with under-capacity conditions. Signal coordination is currently provided along Honoapiilani Highway between Leialii Parkway to Keawe Street.

#### **3.3.2 Existing Intersection Analysis**

The observations and analysis described below are based on prevailing observations during the time at which the data was collected. Hereinafter, observations that are expressed as ongoing and current shall represent the conditions that prevailed at the time at which the data was collected. All movements at the study intersection generally operated adequately at LOS D or better and under-capacity conditions, except for the following:

##### **[1] Honoapiilani Highway/Napili Hau Street**

This intersection operated at overall LOS B during all peak hours of traffic. However, the southbound left-turn movement experienced LOS F during the AM and PM peak hours due to low left-turn turning volumes ( $\leq 10$  vehicles) and long cycle length.

##### **[3] Honoapiilani Highway/Akahahele Street**

This intersection operated at overall LOS B during all peak hours of traffic. However, various left-turn movements operated at LOS E/F during all peak hours of traffic due to low left-turn turning volumes ( $\leq 10$  vehicles) and long cycle length.



#### [4] Honoapiilani Highway/Lower Honoapiilani Road

This intersection operated at overall LOS B during all peak hours of traffic. However, the southbound left-turn movement experienced LOS E during the PM peak hour due to a low left-turn turning volume (1 vehicle) and long cycle length. Observations indicate the northbound left-turn movement would occasionally queue beyond its storage length. However, due to a long northbound left-turn signal phase, most vehicles would clear within a single signal cycle.

#### [5] Honoapiilani Highway/Kai Malina Parkway/Halawai Drive

This intersection operated at overall LOS A during all peak hours of traffic. However, the southbound left-turn movement experienced LOS E during the PM peak hour due to a low left-turn turning volume (8 vehicles) and long cycle length.

#### [6] Honoapiilani Highway/Puukolii Road/Kai Ala Drive

This intersection operated at overall LOS B during all peak hours of traffic. However, various major street left-turn movements and minor street approaches operated at LOS E/F during the AM and PM peak hours due to fixed signal cycle lengths from the weekday signal coordination.

#### [7] Honoapiilani Highway/Kaanapali Parkway/Halelo Street

This intersection operated at overall LOS D or better during all peak hours of traffic. All mainline through movements operated at LOS D or better at under-capacity conditions. Numerous major street left-turn movements and minor street approaches operate at LOS E/F conditions during the PM peak hour due to lengthy delays as a result of the through movement green time that can provide over 200 seconds per cycle. However, observations indicated that the through signal phase would often gap out prior to reaching its maximum through movement timing.

#### [8-10] Honoapiilani Highway from Leialii Parkway to Kapunakea Street

All intersections along this stretch are coordinated during all peak hours of traffic and operated at overall LOS B or better. Various major street left-turn movements and minor street approaches operated at LOS E/F during the AM and PM peak hours due to fixed signal cycle lengths from the signal coordination timing plans.

#### [11] Honoapiilani Highway/Keawe Street/Lahaina Cannery Mall

This intersection is also coordinated with the above three (3) intersections and operated at overall LOS D or better during all peak hours of traffic. However, the southbound left-turn operated at LOS F and over-capacity during the PM peak hour. Observations indicated the southbound left-turn movement can queue beyond its storage lane and require two signal cycle lengths to clear. This intersection currently serves as the northern terminus connection to Honoapiilani Highway to/from the Lahaina Bypass Road.

Figure 3.1 illustrates the existing lane configurations, volumes and LOS. See Table 3.1 for a summary of the existing conditions analysis.



LEGEND

AA(AA)[AA] - AM(PM)[WE] PEAK HOUR OF TRAFFIC VOLUMES

X(X)[X] - AM(PM)[WE] LOS



- SIGNALIZED INTERSECTION Y, OVERALL AM/PM/WE LOS

NOTE:

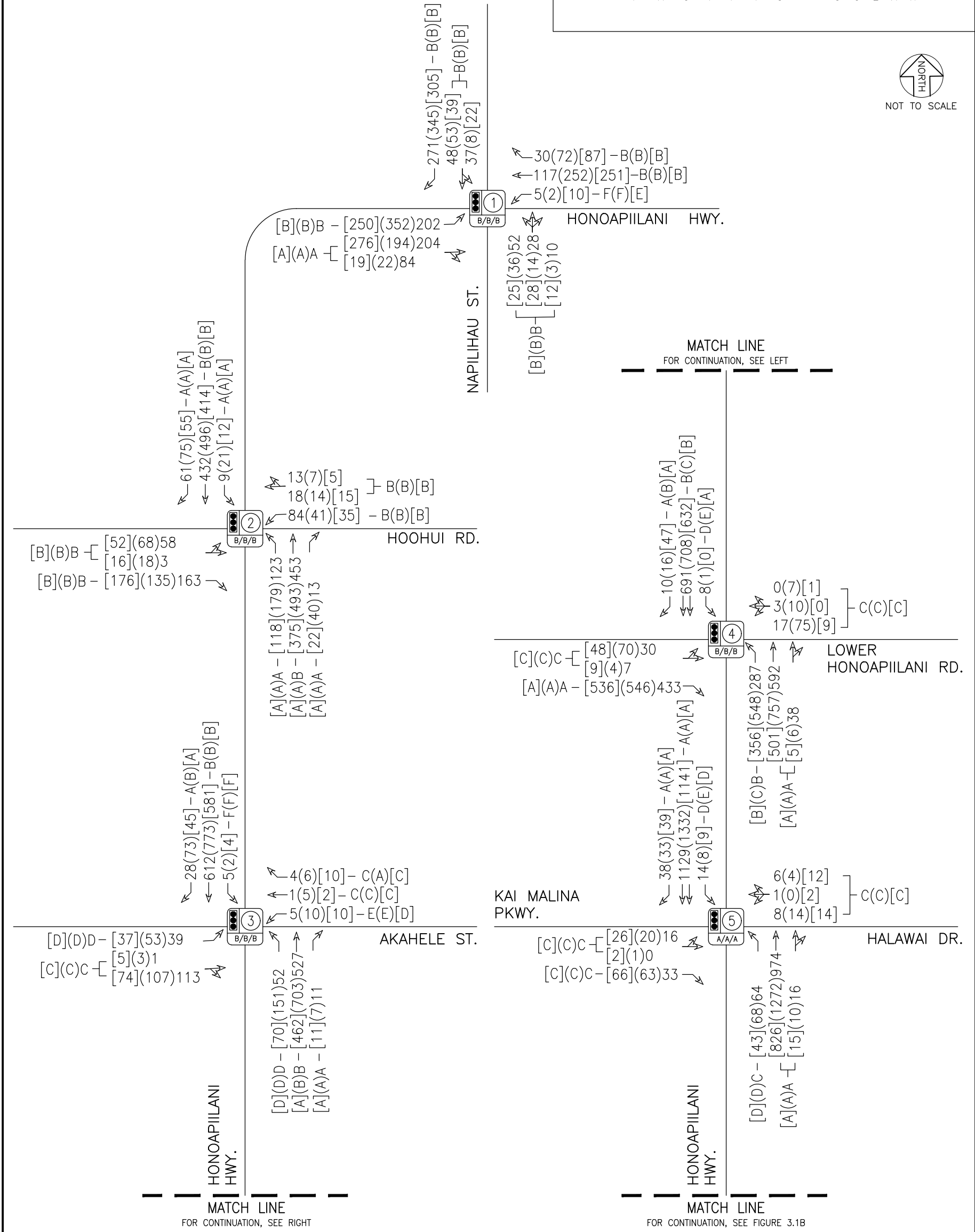
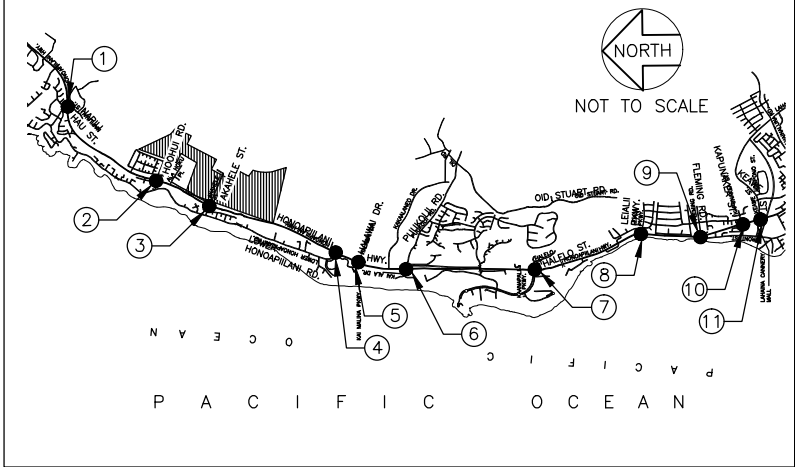
THIS DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY. DO NOT USE FOR CONSTRUCTION.

DATE OF COUNTS:  
November 30, 2016  
December 1, 2016  
December 6, 2016  
December 7, 2016  
December 10, 2016  
January 21, 2017

AM PEAK HOUR:  
7:15 AM - 8:15 AM

PM PEAK HOUR:  
3:45 PM - 4:45 PM

WE PEAK HOUR:  
11:30 WE - 12:30 WE



|           |                                                                                                                                                                  |        |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| PULELEHUA |  AUSTIN, TSUTSUMI & ASSOCIATES, INC.<br>ENGINEERS,SURVEYORS • HONOLULU,HAWAII | FIGURE |
|           | EXISTING LANE CONFIGURATION, VOLUMES AND LOS                                                                                                                     | 3.1A   |

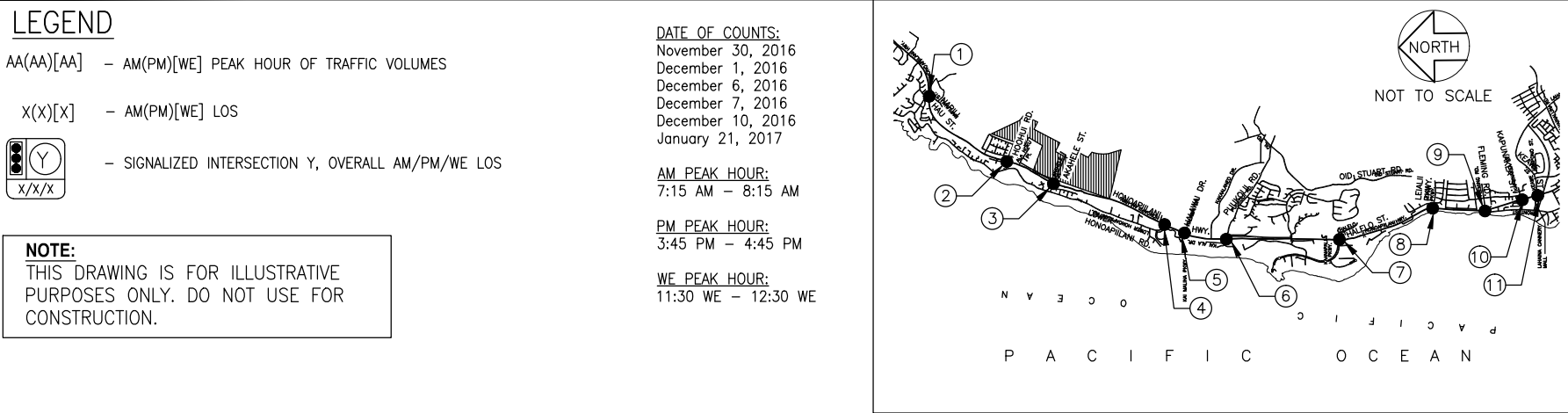




Table 3.1: Existing Conditions Level of Service Summary

| Intersection                                                          | Existing Conditions |           |     |           |           |     |           |           |     |
|-----------------------------------------------------------------------|---------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|
|                                                                       | AM                  |           |     | PM        |           |     | WE        |           |     |
|                                                                       | HCM Delay           | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS |
| <b>1: Honoapiilani Highway &amp; Napilihau Street</b>                 |                     |           |     |           |           |     |           |           |     |
| NB LT                                                                 | 18.5                | 0.74      | B   | 18.3      | 0.80      | B   | 18.3      | 0.76      | B   |
| NB TH/RT                                                              | 8.1                 | 0.39      | A   | 6.0       | 0.24      | A   | 7.4       | 0.37      | A   |
| EB LT/TH                                                              | 14.9                | 0.23      | B   | 18.4      | 0.20      | B   | 16.2      | 0.19      | B   |
| EB RT                                                                 | 14.5                | 0.16      | B   | 18.0      | 0.13      | B   | 16.1      | 0.15      | B   |
| WB LT/TH/RT                                                           | 15.5                | 0.28      | B   | 18.5      | 0.19      | B   | 16.2      | 0.19      | B   |
| SB LT                                                                 | 97.0                | 0.69      | F   | 95.1      | 0.50      | F   | 67.1      | 0.72      | E   |
| SB TH                                                                 | 11.5                | 0.26      | B   | 16.6      | 0.57      | B   | 14.2      | 0.53      | B   |
| SB RT                                                                 | 10.3                | 0.02      | B   | 12.5      | 0.05      | B   | 10.9      | 0.07      | B   |
| Overall                                                               | 13.5                | -         | B   | 15.2      | -         | B   | 14.0      | -         | B   |
| <b>2: Honoapiilani Highway &amp; Hoohui Road</b>                      |                     |           |     |           |           |     |           |           |     |
| NB LT                                                                 | 8.8                 | 0.30      | A   | 8.0       | 0.41      | A   | 8.0       | 0.28      | A   |
| NB TH                                                                 | 10.4                | 0.61      | B   | 8.6       | 0.60      | A   | 8.8       | 0.53      | A   |
| NB RT                                                                 | 0.0                 | 0.00      | A   | 0.0       | 0.00      | A   | 0.0       | 0.00      | A   |
| EB LT/TH                                                              | 15.4                | 0.16      | B   | 17.8      | 0.28      | B   | 14.5      | 0.19      | B   |
| EB RT                                                                 | 14.6                | 0.07      | B   | 16.6      | 0.06      | B   | 14.0      | 0.09      | B   |
| WB LT                                                                 | 17.6                | 0.25      | B   | 19.5      | 0.17      | B   | 15.6      | 0.11      | B   |
| WB TH/RT                                                              | 14.5                | 0.06      | B   | 16.6      | 0.07      | B   | 13.9      | 0.06      | B   |
| SB LT                                                                 | 9.6                 | 0.03      | A   | 7.8       | 0.05      | A   | 8.0       | 0.03      | A   |
| SB TH                                                                 | 14.2                | 0.73      | B   | 12.3      | 0.73      | B   | 11.9      | 0.69      | B   |
| SB RT                                                                 | 9.6                 | 0.05      | A   | 7.9       | 0.05      | A   | 8.2       | 0.04      | A   |
| Overall                                                               | 12.4                | -         | B   | 10.9      | -         | B   | 10.6      | -         | B   |
| <b>3: Honoapiilani Highway &amp; Akahele Street</b>                   |                     |           |     |           |           |     |           |           |     |
| NB LT                                                                 | 42.1                | 0.79      | D   | 36.4      | 0.78      | D   | 35.4      | 0.77      | D   |
| NB TH                                                                 | 10.8                | 0.64      | B   | 11.6      | 0.71      | B   | 9.9       | 0.56      | A   |
| NB RT                                                                 | 7.0                 | 0.01      | A   | 6.3       | 0.01      | A   | 6.9       | 0.01      | A   |
| EB LT                                                                 | 36.9                | 0.68      | D   | 49.2      | 0.78      | D   | 36.0      | 0.66      | D   |
| EB TH/RT                                                              | 20.3                | 0.07      | C   | 27.1      | 0.05      | C   | 20.3      | 0.05      | C   |
| WB LT                                                                 | 64.3                | 0.53      | E   | 59.3      | 0.56      | E   | 46.2      | 0.55      | D   |
| WB TH                                                                 | 21.4                | 0.01      | C   | 29.0      | 0.03      | C   | 21.2      | 0.01      | C   |
| WB RT                                                                 | 21.4                | 0.01      | C   | 0.0       | 0.00      | A   | 21.2      | 0.01      | C   |
| SB LT                                                                 | 106.1               | 0.70      | F   | 114.5     | 0.40      | F   | 117.6     | 0.70      | F   |
| SB TH                                                                 | 14.3                | 0.80      | B   | 19.4      | 0.85      | B   | 14.3      | 0.79      | B   |
| SB RT                                                                 | 8.1                 | 0.02      | A   | 10.6      | 0.05      | B   | 8.4       | 0.03      | A   |
| Overall                                                               | 15.2                | -         | B   | 18.7      | -         | B   | 15.0      | -         | B   |
| <b>4: Honoapiilani Highway &amp; Lower Honoapiilani Road</b>          |                     |           |     |           |           |     |           |           |     |
| NB LT                                                                 | 19.3                | 0.80      | B   | 24.5      | 0.91      | C   | 18.5      | 0.83      | B   |
| NB TH/RT                                                              | 4.8                 | 0.31      | A   | 4.4       | 0.32      | A   | 2.6       | 0.21      | A   |
| EB LT/TH                                                              | 21.2                | 0.15      | C   | 32.3      | 0.31      | C   | 22.4      | 0.24      | C   |
| EB RT                                                                 | 0.0                 | 0.00      | A   | 0.0       | 0.00      | A   | 0.0       | 0.00      | A   |
| WB LT/TH/RT                                                           | 20.8                | 0.08      | C   | 33.1      | 0.39      | C   | 21.2      | 0.04      | C   |
| SB LT                                                                 | 48.5                | 0.72      | D   | 74.6      | 0.42      | E   | 0.0       | 0.00      | A   |
| SB TH                                                                 | 11.7                | 0.53      | B   | 21.8      | 0.64      | C   | 12.9      | 0.53      | B   |
| SB RT                                                                 | 8.7                 | 0.00      | A   | 16.1      | 0.01      | B   | 10.0      | 0.03      | A   |
| Overall                                                               | 10.9                | -         | B   | 17.2      | -         | B   | 11.2      | -         | B   |
| <b>5: Honoapiilani Highway &amp; Kai Malina Parkway/Halawai Drive</b> |                     |           |     |           |           |     |           |           |     |
| NB LT                                                                 | 29.7                | 0.79      | C   | 38.4      | 0.78      | D   | 36.3      | 0.82      | D   |
| NB TH/RT                                                              | 4.3                 | 0.44      | A   | 6.5       | 0.56      | A   | 4.9       | 0.39      | A   |
| EB LT/TH                                                              | 23.4                | 0.08      | C   | 28.3      | 0.08      | C   | 22.8      | 0.11      | C   |
| EB RT                                                                 | 23.7                | 0.02      | C   | 28.4      | 0.01      | C   | 22.8      | 0.01      | C   |
| WB LT/TH/RT                                                           | 23.9                | 0.06      | C   | 28.7      | 0.06      | C   | 22.7      | 0.07      | C   |
| SB LT                                                                 | 43.5                | 0.75      | D   | 62.5      | 0.74      | E   | 50.5      | 0.73      | D   |
| SB TH                                                                 | 5.5                 | 0.54      | A   | 8.4       | 0.64      | A   | 6.3       | 0.56      | A   |
| SB RT                                                                 | 3.4                 | 0.03      | A   | 4.7       | 0.02      | A   | 3.9       | 0.03      | A   |
| Overall                                                               | 6.1                 | -         | A   | 8.7       | -         | A   | 6.9       | -         | A   |
| <b>6: Honoapiilani Highway &amp; Kai Ala Drive/Puukolii Road</b>      |                     |           |     |           |           |     |           |           |     |
| NB LT                                                                 | 84.5                | 0.84      | F   | 86.0      | 0.86      | F   | 33.8      | 0.77      | C   |
| NB TH                                                                 | 5.0                 | 0.37      | A   | 7.6       | 0.48      | A   | 8.0       | 0.41      | A   |
| NB RT                                                                 | 3.4                 | 0.04      | A   | 4.7       | 0.04      | A   | 6.0       | 0.03      | A   |
| EB LT/TH                                                              | 69.2                | 0.33      | E   | 68.2      | 0.35      | E   | 24.5      | 0.15      | C   |
| EB RT                                                                 | 64.5                | 0.01      | E   | 64.1      | 0.02      | E   | 24.0      | 0.07      | C   |
| WB LT                                                                 | 75.0                | 0.38      | E   | 77.8      | 0.49      | E   | 26.7      | 0.14      | C   |
| WB TH/RT                                                              | 65.3                | 0.10      | E   | 64.2      | 0.02      | E   | 23.8      | 0.02      | C   |
| SB LT                                                                 | 82.7                | 0.67      | F   | 90.9      | 0.77      | F   | 35.3      | 0.53      | D   |
| SB TH                                                                 | 8.2                 | 0.44      | A   | 13.3      | 0.58      | B   | 12.0      | 0.64      | B   |
| SB RT                                                                 | 5.3                 | 0.02      | A   | 7.7       | 0.06      | A   | 7.6       | 0.04      | A   |
| Overall                                                               | 13.7                | -         | B   | 17.3      | -         | B   | 12.4      | -         | B   |

Table 3.1: Existing Conditions Level of Service Summary Cont'd

| Intersection                                                         | Existing Conditions |           |     |           |           |     |           |           |     |
|----------------------------------------------------------------------|---------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|
|                                                                      | AM                  |           |     | PM        |           |     | WE        |           |     |
|                                                                      | HCM Delay           | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS |
| <b>7: Honoapiilani Highway &amp; Kaanapali Parkway/Halelo Street</b> |                     |           |     |           |           |     |           |           |     |
| NB LT                                                                | 35.8                | 0.72      | D   | 75.6      | 0.83      | E   | 42.2      | 0.67      | D   |
| NB TH/RT                                                             | 16.1                | 0.62      | B   | 22.0      | 0.61      | C   | 15.4      | 0.51      | B   |
| EB LT/TH                                                             | 37.9                | 0.57      | D   | 71.4      | 0.83      | E   | 39.5      | 0.69      | D   |
| EB RT                                                                | 23.1                | 0.10      | C   | 47.3      | 0.49      | D   | 26.9      | 0.30      | C   |
| WB LT/TH/RT                                                          | 38.9                | 0.16      | D   | 82.1      | 0.18      | F   | 46.5      | 0.22      | D   |
| SB LT                                                                | 40.2                | 0.31      | D   | 84.8      | 0.57      | F   | 44.5      | 0.22      | D   |
| SB TH                                                                | 22.7                | 0.72      | C   | 37.5      | 0.83      | D   | 22.1      | 0.74      | C   |
| SB RT                                                                | 15.6                | 0.07      | B   | 21.8      | 0.11      | C   | 14.9      | 0.14      | B   |
| Overall                                                              | 23.0                | -         | C   | 40.0      | -         | D   | 23.6      | -         | C   |
| <b>8: Honoapiilani Highway &amp; Leialii Parkway</b>                 |                     |           |     |           |           |     |           |           |     |
| NB LT                                                                | 81.1                | 0.43      | F   | 71.1      | 0.49      | E   | 83.4      | 0.42      | F   |
| NB TH/RT                                                             | 7.2                 | 0.60      | A   | 9.2       | 0.65      | A   | 2.0       | 0.49      | A   |
| EB LT/TH/RT                                                          | 58.7                | 0.02      | E   | 57.1      | 0.05      | E   | 50.4      | 0.01      | D   |
| WB LT                                                                | 62.2                | 0.36      | E   | 62.8      | 0.53      | E   | 58.4      | 0.62      | E   |
| WB TH/RT                                                             | 58.9                | 0.01      | E   | 57.1      | 0.04      | E   | 50.7      | 0.03      | D   |
| SB LT                                                                | 67.8                | 0.43      | E   | 66.4      | 0.76      | E   | 69.6      | 0.76      | E   |
| SB TH/RT                                                             | 4.3                 | 0.43      | A   | 8.7       | 0.72      | A   | 7.7       | 0.60      | A   |
| Overall                                                              | 7.8                 | -         | A   | 11.6      | -         | B   | 9.4       | -         | A   |
| <b>9: Honoapiilani Highway &amp; Front Street/Flemming Road</b>      |                     |           |     |           |           |     |           |           |     |
| NB LT                                                                | 122.6               | 0.70      | F   | 101.6     | 0.74      | F   | 95.2      | 0.83      | F   |
| NB TH/RT                                                             | 6.2                 | 0.57      | A   | 1.5       | 0.60      | A   | 13.0      | 0.40      | B   |
| EB LT/TH/RT                                                          | 52.2                | 0.43      | D   | 59.0      | 0.70      | E   | 58.8      | 0.62      | E   |
| WB LT/TH/RT                                                          | 54.4                | 0.60      | D   | 51.5      | 0.25      | D   | 54.5      | 0.33      | D   |
| SB LT                                                                | 93.5                | 0.76      | F   | 119.3     | 0.70      | F   | 93.2      | 0.78      | F   |
| SB TH                                                                | 4.3                 | 0.41      | A   | 8.8       | 0.67      | A   | 5.6       | 0.53      | A   |
| SB RT                                                                | 3.0                 | 0.10      | A   | 4.9       | 0.20      | A   | 3.5       | 0.15      | A   |
| Overall                                                              | 9.1                 | -         | A   | 8.9       | -         | A   | 12.5      | -         | B   |
| <b>10: Honoapiilani Highway &amp; Kapunakea Street</b>               |                     |           |     |           |           |     |           |           |     |
| NB LT                                                                | 79.2                | 0.80      | E   | 67.5      | 0.78      | E   | 70.9      | 0.79      | E   |
| NB TH/RT                                                             | 1.2                 | 0.56      | A   | 1.2       | 0.60      | A   | 0.9       | 0.48      | A   |
| EB LT/TH                                                             | 60.1                | 0.56      | E   | 60.5      | 0.70      | E   | 57.6      | 0.67      | E   |
| EB RT                                                                | 51.1                | 0.01      | D   | 47.1      | 0.02      | D   | 46.9      | 0.02      | D   |
| WB LT                                                                | 59.2                | 0.59      | E   | 51.0      | 0.34      | D   | 49.9      | 0.30      | D   |
| WB TH/RT                                                             | 52.1                | 0.11      | D   | 47.7      | 0.09      | D   | 47.4      | 0.08      | D   |
| SB LT                                                                | 104.5               | 0.79      | F   | 77.3      | 0.80      | E   | 90.6      | 0.85      | F   |
| SB TH/RT                                                             | 7.8                 | 0.47      | A   | 14.8      | 0.74      | B   | 3.3       | 0.64      | A   |
| Overall                                                              | 10.5                | -         | B   | 14.0      | -         | B   | 8.6       | -         | A   |
| <b>11: Honoapiilani Highway &amp; Keawe Street</b>                   |                     |           |     |           |           |     |           |           |     |
| NB LT                                                                | 74.9                | 0.78      | E   | 67.2      | 0.79      | E   | 62.4      | 0.82      | E   |
| NB TH                                                                | 24.1                | 0.57      | C   | 41.0      | 0.81      | D   | 34.7      | 0.63      | C   |
| NB RT                                                                | 17.8                | 0.14      | B   | 29.3      | 0.32      | C   | 29.4      | 0.31      | C   |
| EB LT/TH                                                             | 61.3                | 0.53      | E   | 64.0      | 0.77      | E   | 53.4      | 0.61      | D   |
| EB RT                                                                | 55.7                | 0.01      | E   | 47.2      | 0.04      | D   | 46.7      | 0.08      | D   |
| WB LT                                                                | 50.0                | 0.50      | D   | 51.7      | 0.72      | D   | 44.0      | 0.66      | D   |
| WB TH                                                                | 44.8                | 0.16      | D   | 36.4      | 0.17      | D   | 34.0      | 0.18      | C   |
| WB RT                                                                | 47.5                | 0.37      | D   | 38.7      | 0.34      | D   | 34.4      | 0.21      | C   |
| SB LT                                                                | 62.1                | 0.94      | E   | 74.1      | 1.02      | F*  | 73.6      | 0.92      | E   |
| SB TH/RT                                                             | 0.9                 | 0.43      | A   | 2.2       | 0.69      | A   | 42.8      | 0.60      | D   |
| Overall                                                              | 24.3                | -         | C   | 32.1      | -         | C   | 44.4      | -         | D   |

\* Denotes overcapacity condition, v/c ≥ 1.

## 4. BASE YEAR TRAFFIC CONDITIONS

The Base Year 2022 was selected to reflect the completion years of Scenarios 1, 2 and 3 of the Project and Base Year 2027 was selected to reflect the completion year of Scenario 4 of the Project as described in Section 1.2. The Base Year 2022 and 2027 scenarios represent the traffic conditions within the study area without the Project. Base Year traffic projections were formulated by applying a defacto growth rate to the existing 2016 traffic count volumes and adding trips generated by known future developments in the vicinity of the Project.

### 4.1 Defacto Growth Rate

Projections for Base Year 2022 and 2027 traffic were based upon a correlation between the existing traffic counts collected by ATA, HDOT's Maui Regional Travel Demand Model (MRTDM) growth for forecast years between 2007 and 2020, and nearby developments in the immediate vicinity of the Project. Many of the known background developments that were added separately to the study network are included in the MRTDM. Therefore, an overall annual growth rate of 0.5% was applied along Honoapiilani Highway for Base Years 2022 and 2027.

### 4.2 Traffic Forecasts for Known Developments

#### 4.2.1 Background Projects

By Year 2022, numerous developments are anticipated to be completed within the Project study area. Many of the following known developments were determined to be accounted for in the MRTDM. The known developments that are projected to be complete by Year 2022 and generate traffic within the Project study area are illustrated in Figure 4.1 and listed below based on the best information available:

1. Kahoma Village – This project is located south of the Lahaina Cannery Mall on 22 acres of land. The project proposes to develop 101 single-family homes and 102 multi-family homes. Construction of the project began in late 2016, and completion is expected to occur at the end of 2018.
2. Kahoma Residential Subdivision – This project is located east of the proposed Kahoma Village and south of the Kahoma Stream Flood Control Channel. The project proposes to develop 68 single-family lots and a neighborhood park. There is currently no expected completion date, however, was included in the Project TIAR.
3. Lanikeha Kaanapali – This project is located east of Honoapiilani Highway and across from Kaanapali Parkway. The project consists of 132 lots in a gated community, with Honoapiilani Highway access provided via Kekaa Drive and Kualapa Loop. Completion and full occupancy of the project is expected by 2017.
4. Kai A Ulu Affordable Homes – This project is located east of Honoapiilani Highway in the Kaanapali region. The project proposes to develop 33 affordable single-family homes with Honoapiilani Highway access provided via Kekaa Drive and Kualapa Loop. Completion of the project is expected in 2017.
5. Westin Nanea Ocean Villas – This project is located west of Honoapiilani Highway at the Honoapiilani Highway/Halawai Drive/Kai Malina Parkway intersection. The project proposes to develop a 390-villa timeshare resort. Completion of the project is expected in the summer of 2017.



6. West Maui Village – This project is located south of Honoapiilani Highway just east of Maui Preparatory Academy. The project proposes to develop 158 single-family units in 25 buildings. Completion of the project is expected in 2018.
7. West Maui Hospital and Medical Center – This project is located east of Honoapiilani Highway in the Kaanapali region. The project proposes to develop a critical access hospital, a skilled nursing facility, medical office buildings and a behavioral health center. Completion of the project is expected in late 2018.
8. Honua Kai – This project is located west of Honoapiilani Highway in the Kaanapali region. The project's remaining component includes 72 luxury townhouses and assumed to be completed by Year 2022.

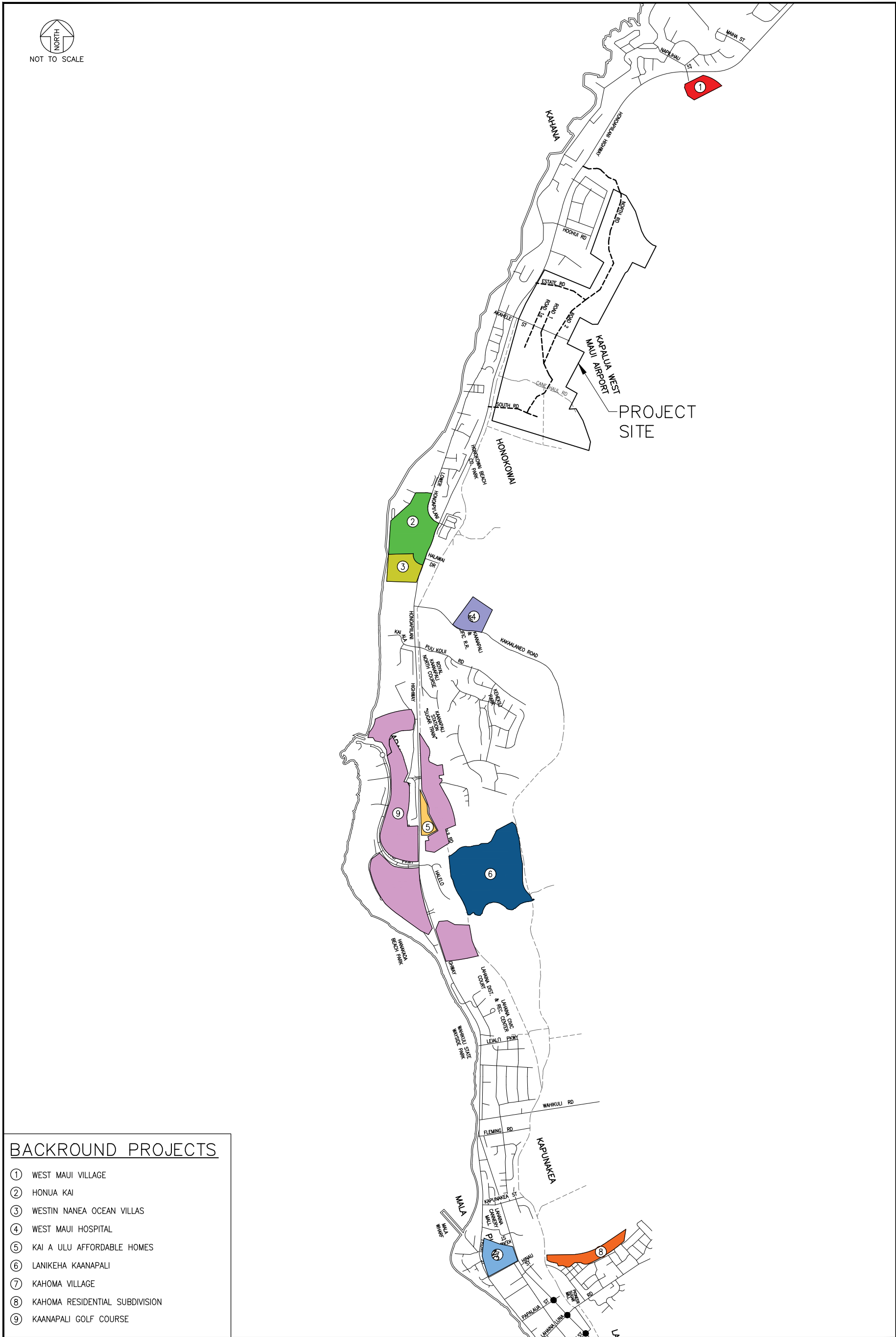
Forecasts for Base Year 2027 include all background developments assumed to be completed by Year 2022. In addition, the known development that is projected to be complete by Year 2027 and generate traffic within the Project study area is illustrated in Figure 4.1 and listed below based on available information:

1. Kaanapali Golf Course Redevelopment – This project is located both mauka and makai of Honoapiilani Highway in the vicinity of the Honoapiilani Highway/Kaanapali Parkway/Halelo Street and Honoapiilani Highway/Kekaa Drive intersections. We understand the project proposes to redevelop the existing Kaanapali Golf Course to potentially provide a 136-room boutique hotel, 102 residential condos and an 80,000 square-foot shopping center. Completion is assumed to occur by Year 2027.

#### **4.2.2 Trip Generation**

The Institute of Transportation Engineers (ITE) publishes a book based on empirical data compiled from a body of more than 4,250 trip generation studies submitted by public agencies, developers, consulting firms, and associations. This publication, titled Trip Generation Manual, 9<sup>th</sup> Edition, provides trip rates and/or formulae based on graphs that correlate vehicular trips with independent variables. The independent variables can range from Dwelling Units (DU) for single-family attached homes to Gross Floor Area (GFA) for commercial or office development. These trip rates/formulae and their associated directional distributions were used to estimate the increase in the number of vehicular trips generated by the proposed Project. The rates selected were based on the land use description.

See Tables 4.1 and 4.2 for Trip Generation formulae and projections for the background developments.



- ① WEST MAUI VILLAGE
- ② HONUA KAI
- ③ WESTIN NANEA OCEAN VILLAS
- ④ WEST MAUI HOSPITAL
- ⑤ KAI A ULU AFFORDABLE HOMES
- ⑥ LANIKEHA KAAPALI
- ⑦ KAHOMA VILLAGE
- ⑧ KAHOMA RESIDENTIAL SUBDIVISION
- ⑨ KAAPALI GOLF COURSE

PULELEHUA

**ATA** AUSTIN, TSUTSUMI & ASSOCIATES, INC.  
ENGINEERS, SURVEYORS • HONOLULU, HAWAII

## BACKGROUND PROJECTS

## 4.1

Table 4.1: Background Projects Trip Generation Rates

| Land Use (ITE Code)                  | Independent Variable | AM Peak Hour |         | PM Peak Hour |         | WE Peak Hour |         |
|--------------------------------------|----------------------|--------------|---------|--------------|---------|--------------|---------|
|                                      |                      | Trip Rate    | % Enter | Trip Rate    | % Enter | Trip Rate    | % Enter |
| Single-Family Detached Housing (210) | Dwelling Units (DU)  | [a]          | 26%     | [b]          | 64%     | [c]          | 54%     |
| Residential Condo/Townhouse (230)    | Dwelling Units (DU)  | [d]          | 17%     | [e]          | 67%     | [f]          | 54%     |
| Luxury Condominium/Townhouse (233)   | Dwelling Units (DU)  | [g]          | 23%     | [h]          | 63%     | [h]          | 63%     |
| Assisted Living (254)                | Beds                 | 0.18         | 68%     | 0.29         | 50%     | 0.36         | 51%     |
| Resort Hotel (330)                   | Rooms                | [i]          | 72%     | 0.42         | 43%     | 0.42         | 43%     |
| Hospital (610)                       | Beds                 | 1.32         | 72%     | 1.42         | 33%     | 1.00         | 47%     |
| Nursing Home (620)                   | Beds                 | 0.17         | 69%     | 0.22         | 33%     | 0.38         | 50%     |
| Medical-Dental Office Building (720) | 1000 SF GFA          | 2.39         | 79%     | [j]          | 28%     | 3.63         | 57%     |
| Shopping Center (820)                | 1000 SF GFA          | [k]          | 62%     | [l]          | 48%     | [m]          | 52%     |

[a]  $T=0.70(X)+9.74$

[b]  $LN(T)=0.90LN(X)+0.51$

[c]  $T=0.89(X)+8.77$

[d]  $LN(T)=0.80*LN(X)+0.26$

[e]  $LN(T)=0.82*LN(X)+0.32$

[f]  $T=0.29*X+42.63$

[g]  $LN(T)=0.76LN(X)+0.54$

[h]  $T=0.78(X)-25.38$

[i]  $T=0.40(X)-40.79$

[j]  $LN(T)=0.90LN(X)+1.53$

[k]  $LN(T)=0.61LN(X)+2.24$

[l]  $LN(T)=0.67LN(X)+3.31$

[m]  $LN(T)=0.65LN(X)+3.78$

Table 4.2: Background Projects Trip Generation

| Land Use                                                | Independent Variable                | AM Peak Hour |            |             | PM Peak Hour |            |             | WE Peak Hour |            |             |
|---------------------------------------------------------|-------------------------------------|--------------|------------|-------------|--------------|------------|-------------|--------------|------------|-------------|
|                                                         |                                     | Enter (vph)  | Exit (vph) | Total (vph) | Enter (vph)  | Exit (vph) | Total (vph) | Enter (vph)  | Exit (vph) | Total (vph) |
| <b>Kahoma Village</b>                                   | 203 SF/MF DU                        | 30           | 103        | 133         | 110          | 59         | 169         | 92           | 80         | 172         |
| <b>Kahoma Residential Subdivision</b>                   | 68 SF DU                            | 15           | 43         | 58          | 48           | 27         | 75          | 38           | 32         | 70          |
| <b>Lanikeha Kaanapali</b>                               | 132 SF DU                           | 27           | 76         | 103         | 90           | 49         | 135         | 69           | 58         | 127         |
| <b>Kai A Ulu Affordable Homes</b>                       | 33 SF DU                            | 9            | 24         | 33          | 25           | 14         | 39          | 21           | 18         | 39          |
| <b>Westin Nanea Ocean Villas</b>                        | 390 Room Hotel                      | 84           | 32         | 116         | 71           | 93         | 164         | 71           | 93         | 164         |
| <b>West Maui Village</b>                                | 158 SF DU                           | 13           | 62         | 75          | 59           | 29         | 88          | 48           | 41         | 89          |
| <b>Honua Kai Townhouses</b>                             | 72 DU                               | 10           | 35         | 45          | 20           | 11         | 31          | 20           | 11         | 31          |
| <b>West Maui Hospital and Medical Center</b>            | 80 Bed Assisted Living Facility     | 153          | 47         | 200         | 79           | 174        | 253         | 160          | 129        | 289         |
|                                                         | 25 Bed Hospital                     |              |            |             |              |            |             |              |            |             |
|                                                         | 60,000 Sq. Ft. Medical Office Bldg. |              |            |             |              |            |             |              |            |             |
| <b>Kaanapali Golf Course Redevelopment <sup>1</sup></b> | 102 Room Hotel                      | 57           | 69         | 125         | 132          | 129        | 261         | 189          | 170        | 358         |
|                                                         | 136 SF/MF DU                        |              |            |             |              |            |             |              |            |             |
|                                                         | 80,000 Sq. Ft. Retail               |              |            |             |              |            |             |              |            |             |
| <b>Total Background External Trips</b>                  |                                     | <b>398</b>   | <b>491</b> | <b>888</b>  | <b>634</b>   | <b>585</b> | <b>1215</b> | <b>708</b>   | <b>632</b> | <b>1339</b> |

## Notes

- SF DU = Single-Family Dwelling Unit
- MF DU = Multi-Family Dwelling Unit
- Forecast trips derived from available TIAR's for each Project, ITE Trip Generation and/or updated to reflect current status.
- Table 4.2 shows total external trips generated by known developments in the vicinity of the Project.

1. Includes approximate 18% internal trip reduction consistent with ITE Trip Generation Handbook, 3rd Edition. Also includes 20% pass-by trip reductions to retail component. Trip reductions applied to only weekday PM and weekend trips.

### 4.3 Planned Roadway Improvements

The following roadway improvements are anticipated to be constructed to support various developments and overall growth of the Lahaina region and were assumed to be completed by Year 2022 and 2027 without the Project.

#### Lahaina Bypass Road Phase 1B-2

The Lahaina Bypass Road (LBR) is a major bypass road that is expected to be completed in 4 phases to address regional traffic congestion near the historic town of Lahaina. The first two phases (1A and 1B-1) were completed in 2013 and ends at Hokiokio Place. Phase 1B-2 will extend LBR from Hokiokio Place to its southern terminus with Honoapiilani Highway and is expected to be completed in January 2018. Future Phases 1C and 1D will extend the bypass highway further north and result in the bypass highway stretching from Olowalu to just south of the existing Kapalua Airport.

Completion of Phase 1B-2 of the LBR is expected to reduce traffic along Honoapiilani Highway by diverting traffic to the LBR and impact traffic patterns south of the Honoapiilani Highway/Keawe Street/Lahaina Cannery Mall intersection. With the LBR Phase 1B-2, there will be five (5) connections between the LBR and Honoapiilani Highway and include Keawe Street, Lahainaluna Road, Hokiokio Place, Kai Hele Ku Street, and the southern terminus. At the southern terminus of the LBR, all regional northbound traffic will be rerouted to the LBR while regional southbound traffic will be able to utilize both Honoapiilani Highway and the LBR. The extension is expected to decrease the north and southbound through movement volumes along Honoapiilani Highway because of an increase in regional throughput traffic using the LBR and intersection improvements at the Honoapiilani Highway/Keawe Street/Lahaina Cannery Mall intersection that will help route more southbound traffic to LBR. Rerouted traffic was generally based on forecast capacity thresholds at the southern terminus and Keawe Street intersection with Honoapiilani Highway.

#### Honoapiilani Highway/Keawe Street/Lahaina Cannery Mall

An additional southbound left-turn lane is planned for the Honoapiilani Highway/Keawe Street/Lahaina Cannery Mall intersection, resulting in dual southbound left-turn lanes. Based on existing conditions, the existing single southbound left-turn lane movement operates at over-capacity conditions. The addition of a second left-turn storage lane is expected to increase capacity and reduce queue spillback. Completion of the double left-turn is expected by 2018.

#### Honoapiilani Highway/Napili Hau Street

An exclusive right-turn lane on the northbound Honoapiilani Highway approach and an exclusive left-turn lane and shared through/right-turn lane on the westbound Napili Hau Street approach is anticipated to be constructed as part of West Maui Village roadway improvements. These changes are expected to mitigate potential traffic problems from the proposed development. Completion of the roadway improvements is expected to occur in 2018 with completion of the development.

### 4.4 Base Year 2022 Analysis

It is anticipated that by Base Year 2022, traffic will have increased over existing conditions due to the development in the Lahaina and Kaanapali regions. Actual growth within the study region may vary based upon the actual construction of the various nearby developments.



#### 4.4.1 Base Year 2022 Intersection Analysis

By Base Year 2022 without the Project, traffic at the study intersections along Honoapiilani Highway is estimated to increase overall by approximately 10-20% on various parts of the corridor during the AM, PM and WE peak hours of traffic. All study intersections are forecast to operate similar to existing conditions. Overall intersection delays generally increased by only 1-5 seconds at most study intersections. The majority of intersection movements currently operating at LOS E/F conditions will continue to operate similarly in Base Year 2022.

##### [7] Honoapiilani Highway/Kaanapali Parkway/Halelo Street

During the PM peak hour, the eastbound shared left-turn/through movement is expected to operate at LOS F and over-capacity. Mitigation is proposed in Section 4.4.2.

##### [8-11] Honoapiilani Highway from Leialii Parkway to Keawe Street

Since the Honoapiilani Highway/Keawe Street intersection will be widened to provide dual southbound left-turn lanes, it was assumed that some of the signal timing plans for intersections along the coordinated corridor from Leialii Parkway to Keawe Street would be reoptimized to make signals run more efficient and improve throughput progression.

Figure 4.2 illustrates the Base Year 2022 forecast traffic volumes and LOS for the study intersection movements. Table 4.3 summarizes the Base Year 2022 LOS at the study intersections compared to existing conditions. LOS worksheets are provided in Appendix C.

#### 4.4.2 Base Year 2022 With Mitigation Intersection Analysis

##### [7] Honoapiilani Highway/Kaanapali Parkway/Halelo Street

- Modify the eastbound approach to incorporate a dedicated left-turn lane, a shared left-turn/through lane and two (2) dedicated right-turn lanes.

With the recommended mitigation, the intersection is anticipated to improve and operate adequately at overall LOS D or better during all peak hours of traffic. Similar to existing conditions, numerous minor street approaches and major street left-turn movements will continue operating at LOS E/F during the PM peak hour due to the long through movement green time and cycle length.

Figure 4.3 illustrates the Base Year 2022 with mitigation forecast traffic volumes and LOS for the study intersection movements. Table 4.3 summarizes the Base Year 2022 with mitigation LOS at the study intersections compared to Base Year 2022 without mitigation. LOS worksheets are provided in Appendix C.

LEGEND

AA(AA)[AA] - AM(PM)[WE] PEAK HOUR OF TRAFFIC VOLUMES

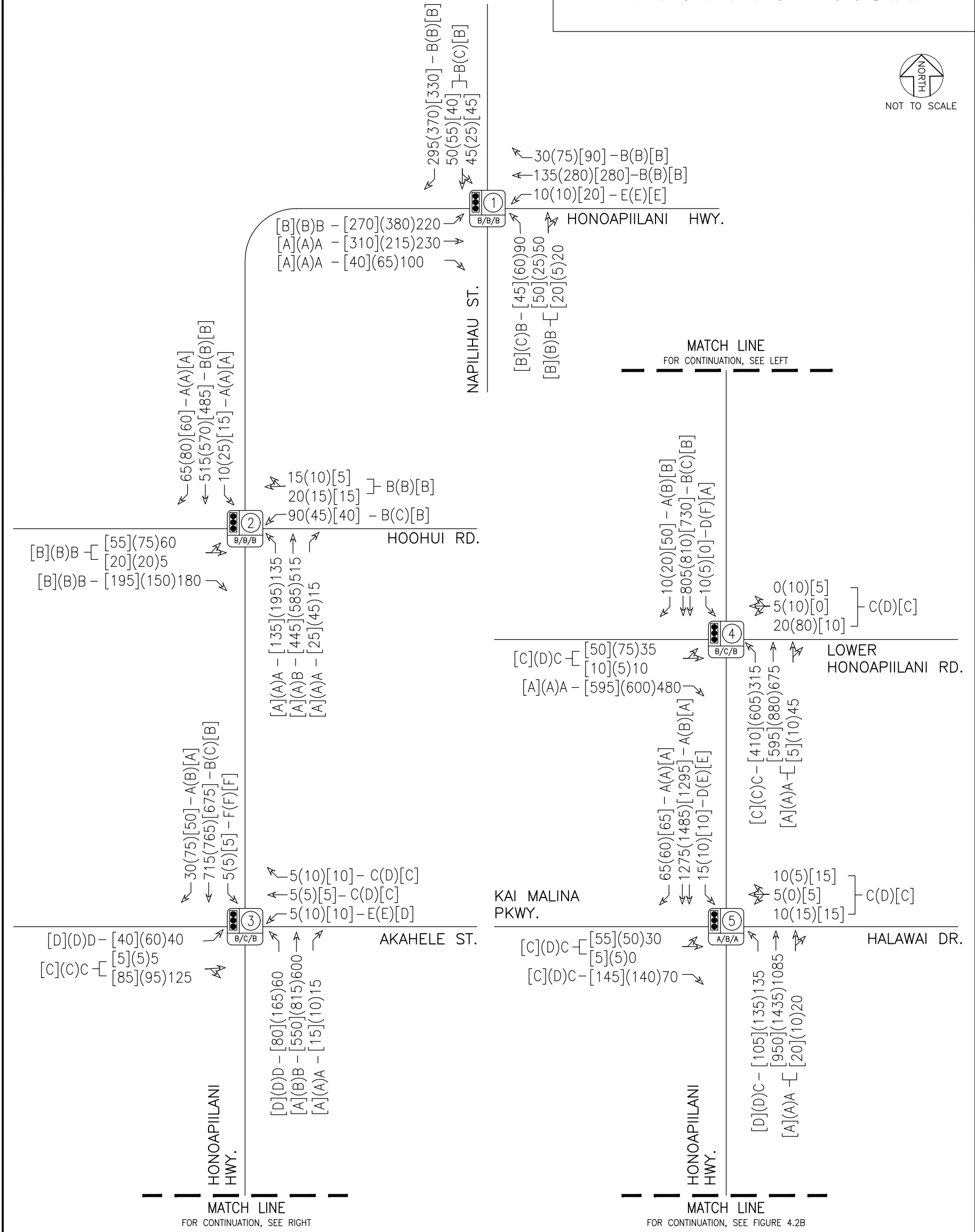
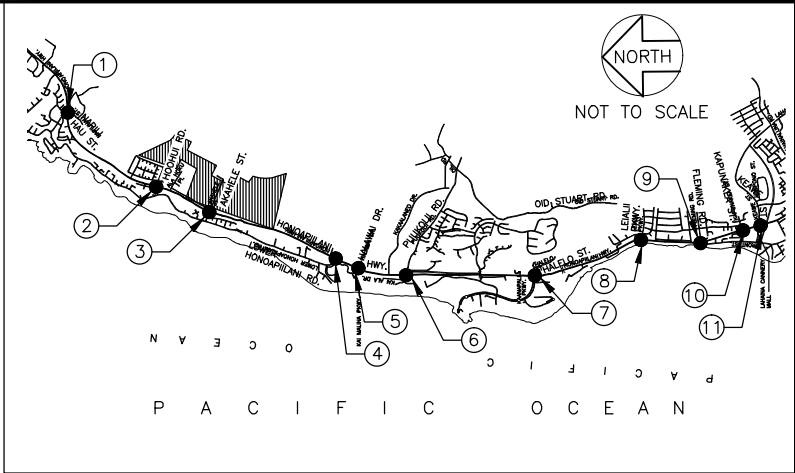
X(X)[X] - AM(PM)[WE] LOS



- SIGNALIZED INTERSECTION Y, OVERALL AM/PM/WE LOS

NOTE:

THIS DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY. DO NOT USE FOR CONSTRUCTION.



|           |                                                                                                                                                |        |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| PULELEHUA |  AUSTIN, TSUTSUMI & ASSOCIATES, INC.<br>ENGINEERS,SURVEYORS | FIGURE |
|           | BASE YEAR 2022 LANE CONFIGURATION, VOLUMES AND LOS                                                                                             | 4.2A   |

### LEGEND

AA(AA)[AA] - AM(PM)[WE] PEAK HOUR OF TRAFFIC VOLUMES

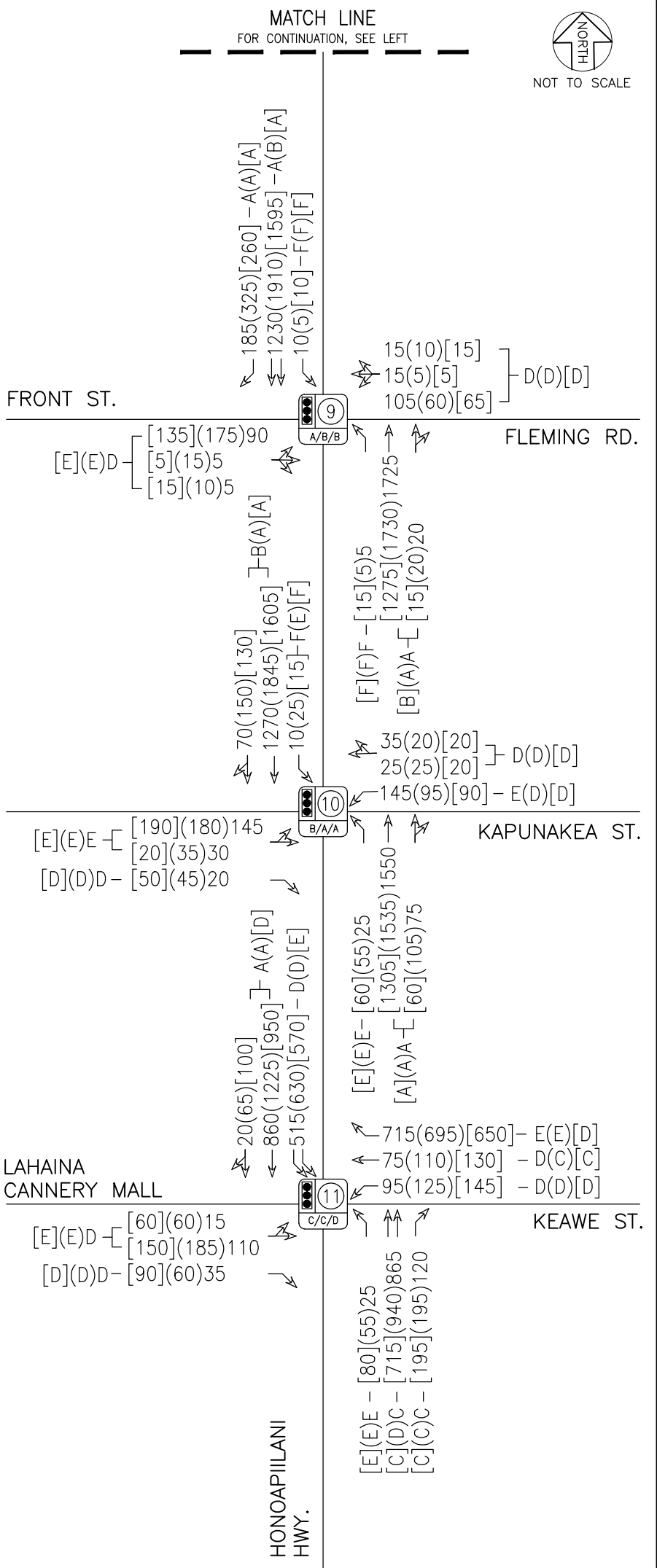
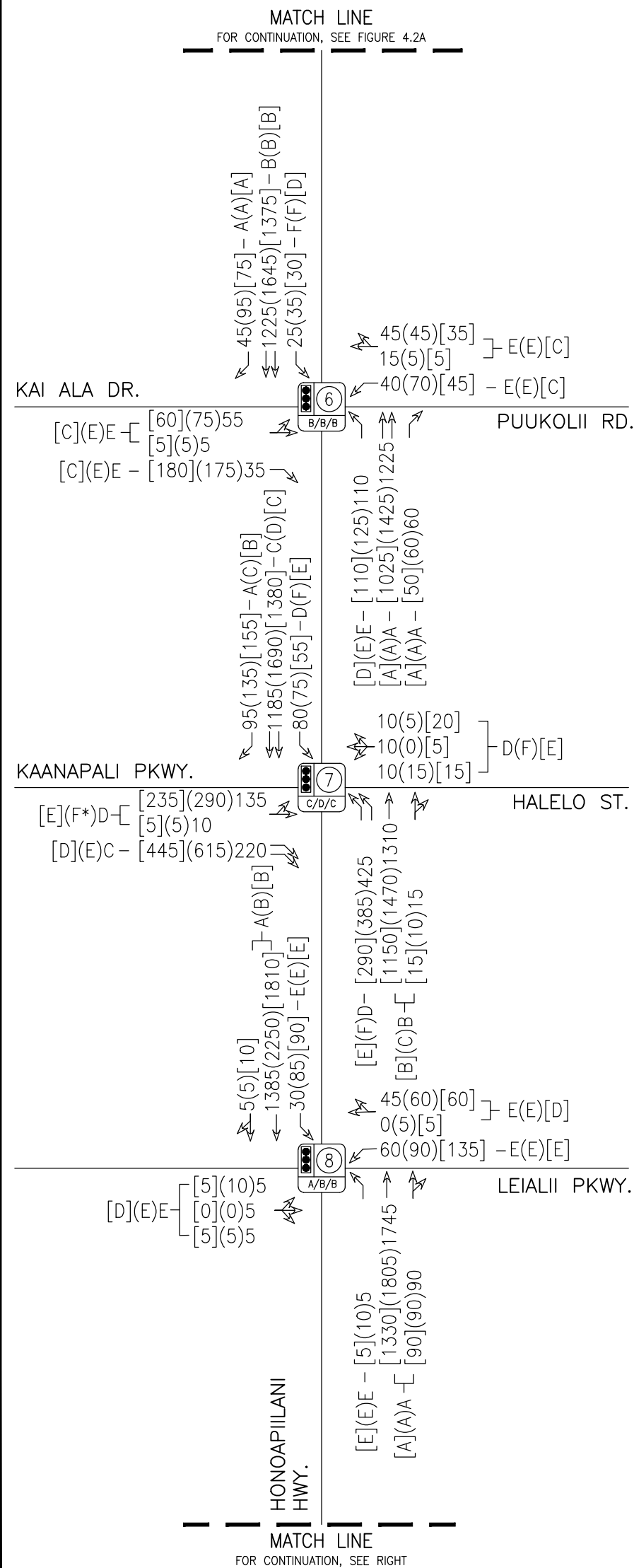
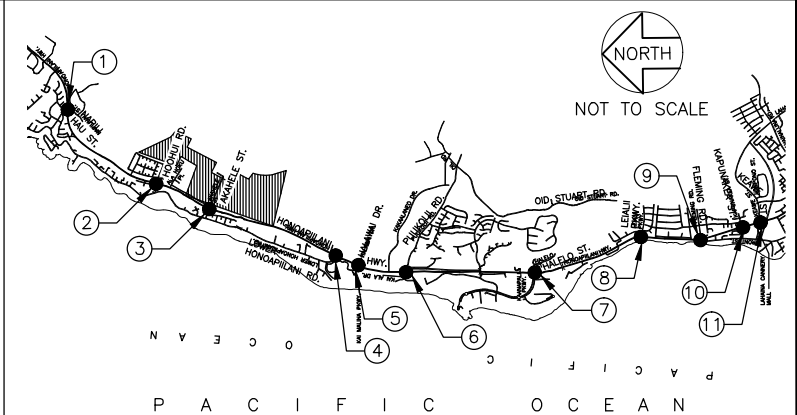
X(X)[X] - AM(PM)[WE] LOS



– SIGNALIZED INTERSECTION Y, OVERALL AM/PM/WE LOS

**NOTE:**

THIS DRAWING IS FOR ILLUSTRATIVE  
PURPOSES ONLY. DO NOT USE FOR  
CONSTRUCTION.



PULELEHUA

AUSTIN, TSUTSUMI & ASSOCIATES, INC.  
ENGINEERS, SURVEYORS • HONOLULU, HAWAII

FIGURE

## BASE YEAR 2022 LANE CONFIGURATION, VOLUMES AND LOS

## 4.2B

LEGEND

AA(AA)[AA] - AM(PM)[WE] PEAK HOUR OF TRAFFIC VOLUMES

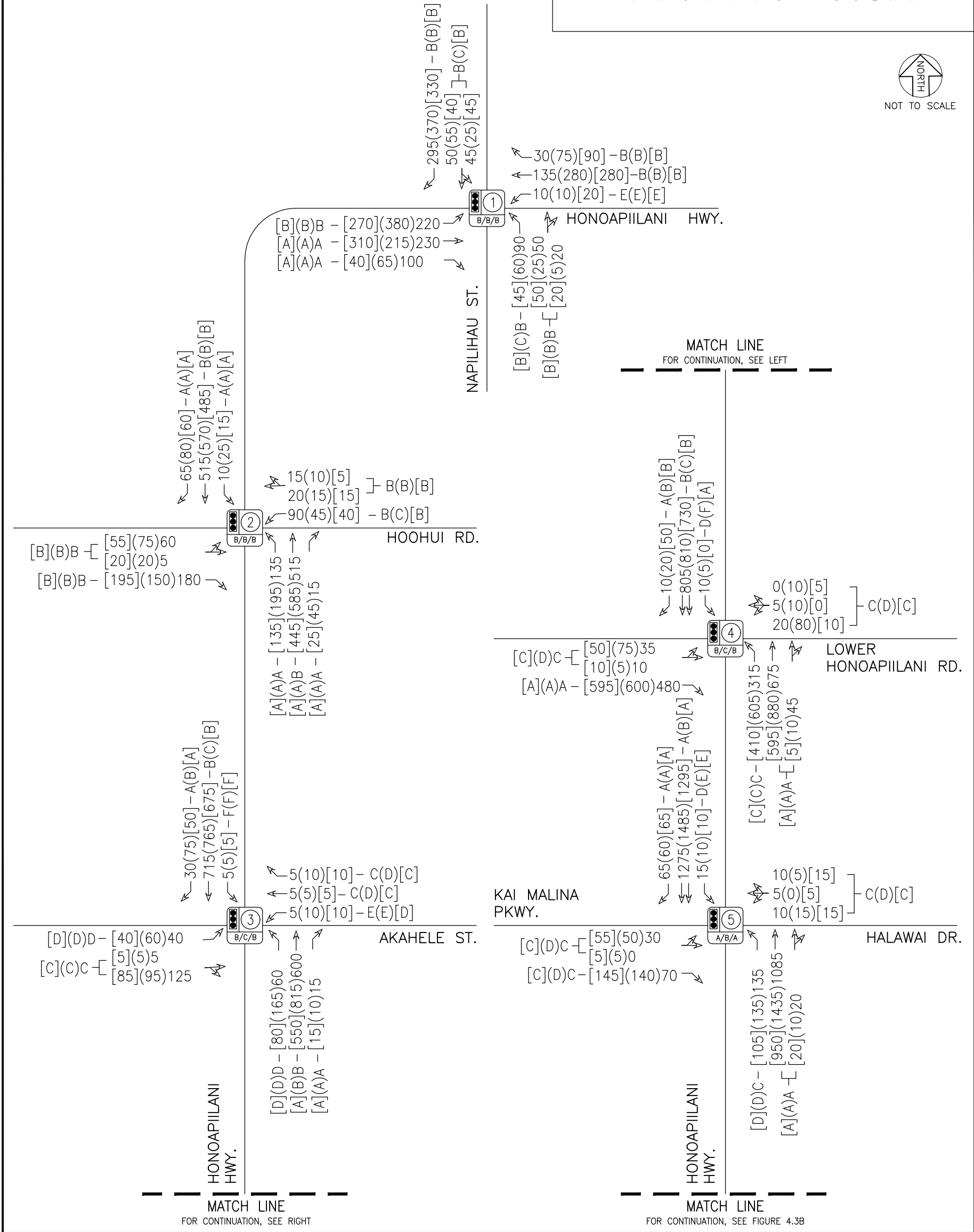
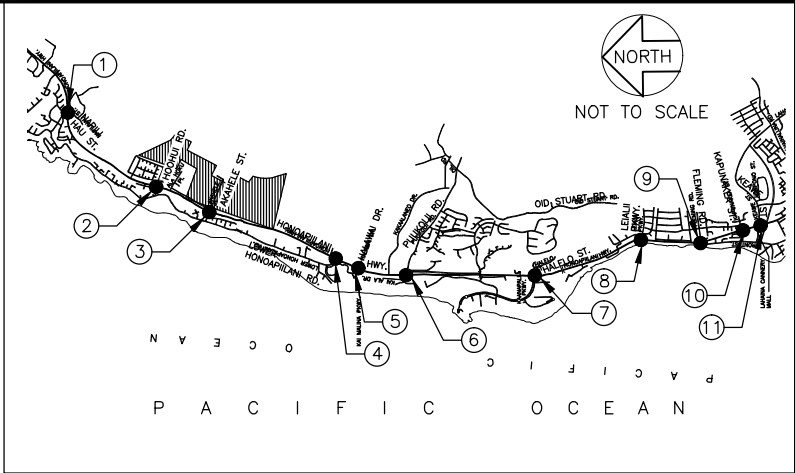
X(X)[X] - AM(PM)[WE] LOS



- SIGNALIZED INTERSECTION Y, OVERALL AM/PM/WE LOS

NOTE:

THIS DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY. DO NOT USE FOR CONSTRUCTION.



|           |                                                                                                                                                |        |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| PULELEHUA |  AUSTIN, TSUTSUMI & ASSOCIATES, INC.<br>ENGINEERS,SURVEYORS | FIGURE |
|           | BASE YEAR 2022 WITH MITIGATION LANE CONFIGURATION,<br>VOLUMES AND LOS                                                                          | 4.3A   |

LEGEND

AA(AA)[AA] - AM(PM)[WE] PEAK HOUR OF TRAFFIC VOLUMES

X(X)[X] - AM(PM)[WE] LOS



- SIGNALIZED INTERSECTION Y, OVERALL AM/PM/WE LOS

NOTE:

THIS DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY. DO NOT USE FOR CONSTRUCTION.

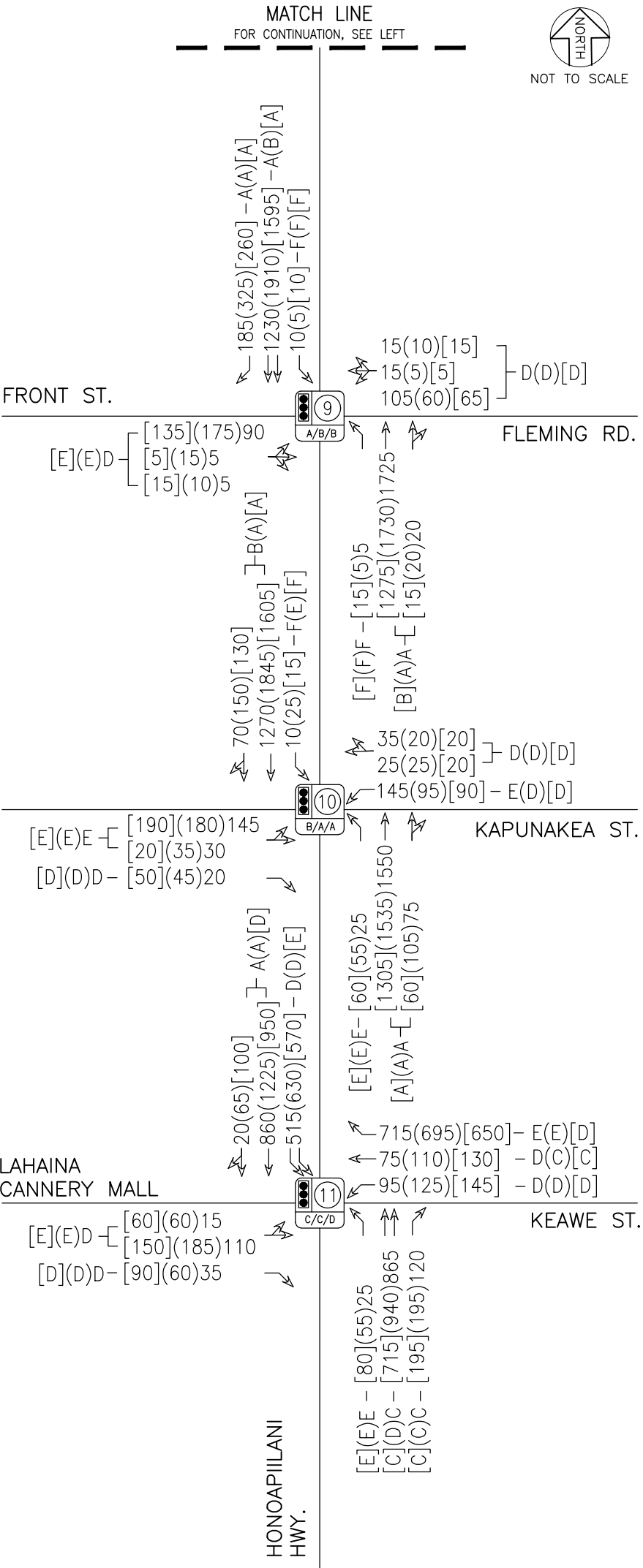
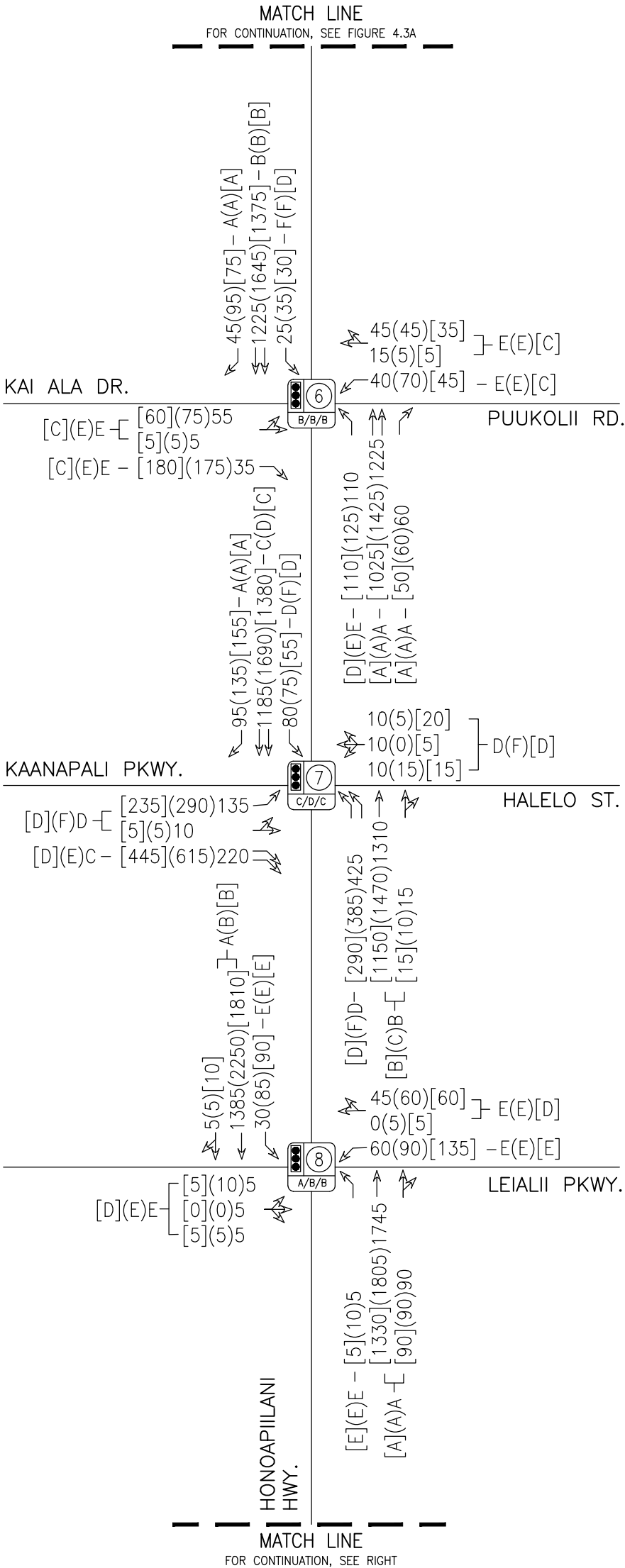
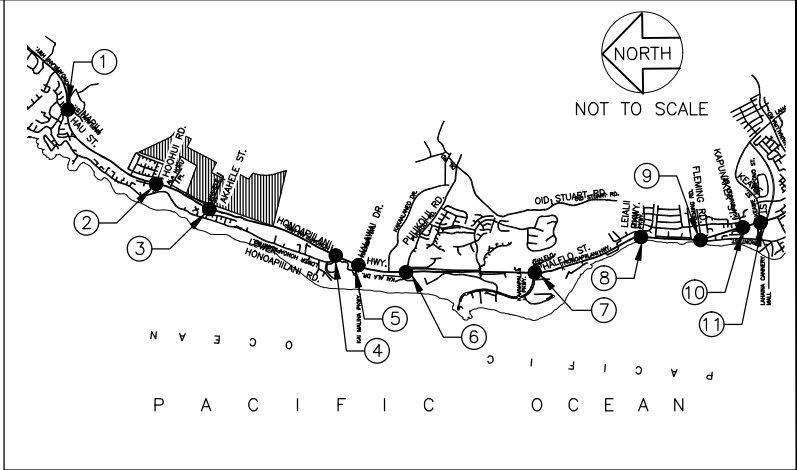




Table 4.3: Existing Conditions, Base Year 2022 and Base Year 2022 with Mitigation Level of Service Summary Cont'd

| Intersection                                               | Existing Conditions |           |     |           |           |     |           |           |     | Base Year 2022 |           |     |           |           |     |           |           |     | Base Year 2022 with Mitigation |           |     |           |           |     |           |           |     |  |
|------------------------------------------------------------|---------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|----------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|--------------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|--|
|                                                            | AM                  |           |     | PM        |           |     | WE        |           |     | AM             |           |     | PM        |           |     | WE        |           |     | AM                             |           |     | PM        |           |     | WE        |           |     |  |
|                                                            | HCM Delay           | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay      | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay                      | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS |  |
| 5: Honoapiilani Highway & Kai Malina Parkway/Halawai Drive |                     |           |     |           |           |     |           |           |     |                |           |     |           |           |     |           |           |     |                                |           |     |           |           |     |           |           |     |  |
| NB LT                                                      | 29.7                | 0.79      | C   | 38.4      | 0.78      | D   | 36.3      | 0.82      | D   | 31.8           | 0.79      | C   | 43.8      | 0.82      | D   | 35.3      | 0.78      | D   | Same as Base Year 2022         |           |     |           |           |     |           |           |     |  |
| NB TH/RT                                                   | 4.3                 | 0.44      | A   | 6.5       | 0.56      | A   | 4.9       | 0.39      | A   | 4.1            | 0.45      | A   | 7.1       | 0.60      | A   | 4.9       | 0.41      | A   |                                |           |     |           |           |     |           |           |     |  |
| EB LT/TH                                                   | 23.4                | 0.08      | C   | 28.3      | 0.08      | C   | 22.8      | 0.11      | C   | 30.4           | 0.16      | C   | 37.0      | 0.22      | D   | 30.2      | 0.25      | C   |                                |           |     |           |           |     |           |           |     |  |
| EB RT                                                      | 23.7                | 0.02      | C   | 28.4      | 0.01      | C   | 22.8      | 0.01      | C   | 30.3           | 0.01      | C   | 36.2      | 0.03      | D   | 29.5      | 0.04      | C   |                                |           |     |           |           |     |           |           |     |  |
| WB LT/TH/RT                                                | 23.9                | 0.06      | C   | 28.7      | 0.06      | C   | 22.7      | 0.07      | C   | 30.9           | 0.11      | C   | 38.1      | 0.08      | D   | 29.5      | 0.10      | C   |                                |           |     |           |           |     |           |           |     |  |
| SB LT                                                      | 43.5                | 0.75      | D   | 62.5      | 0.74      | E   | 50.5      | 0.73      | D   | 53.5           | 0.78      | D   | 73.1      | 0.78      | E   | 59.7      | 0.75      | E   |                                |           |     |           |           |     |           |           |     |  |
| SB TH                                                      | 5.5                 | 0.54      | A   | 8.4       | 0.64      | A   | 6.3       | 0.56      | A   | 7.7            | 0.61      | A   | 12.5      | 0.72      | B   | 8.8       | 0.63      | A   |                                |           |     |           |           |     |           |           |     |  |
| SB RT                                                      | 3.4                 | 0.03      | A   | 4.7       | 0.02      | A   | 3.9       | 0.03      | A   | 4.5            | 0.04      | A   | 6.4       | 0.04      | A   | 5.1       | 0.04      | A   |                                |           |     |           |           |     |           |           |     |  |
| Overall                                                    | 6.1                 | -         | A   | 8.7       | -         | A   | 6.9       | -         | A   | 8.1            | -         | A   | 12.1      | -         | B   | 9.3       | -         | A   |                                |           |     |           |           |     |           |           |     |  |
| 6: Honoapiilani Highway & Kai Ala Drive/Puukolii Road      |                     |           |     |           |           |     |           |           |     |                |           |     |           |           |     |           |           |     |                                |           |     |           |           |     |           |           |     |  |
| NB LT                                                      | 84.5                | 0.84      | F   | 86.0      | 0.86      | F   | 33.8      | 0.77      | C   | 74.0           | 0.85      | E   | 78.1      | 0.86      | E   | 39.8      | 0.78      | D   | Same as Base Year 2022         |           |     |           |           |     |           |           |     |  |
| NB TH                                                      | 5.0                 | 0.37      | A   | 7.6       | 0.48      | A   | 8.0       | 0.41      | A   | 6.2            | 0.48      | A   | 9.8       | 0.58      | A   | 8.2       | 0.49      | A   |                                |           |     |           |           |     |           |           |     |  |
| NB RT                                                      | 3.4                 | 0.04      | A   | 4.7       | 0.04      | A   | 6.0       | 0.03      | A   | 3.8            | 0.04      | A   | 5.4       | 0.04      | A   | 5.5       | 0.03      | A   |                                |           |     |           |           |     |           |           |     |  |
| EB LT/TH                                                   | 69.2                | 0.33      | E   | 68.2      | 0.35      | E   | 24.5      | 0.15      | C   | 68.7           | 0.38      | E   | 67.2      | 0.37      | E   | 31.3      | 0.23      | C   |                                |           |     |           |           |     |           |           |     |  |
| EB RT                                                      | 64.5                | 0.01      | E   | 64.1      | 0.02      | E   | 24.0      | 0.07      | C   | 63.3           | 0.01      | E   | 63.7      | 0.13      | E   | 30.1      | 0.05      | C   |                                |           |     |           |           |     |           |           |     |  |
| WB LT                                                      | 75.0                | 0.38      | E   | 77.8      | 0.49      | E   | 26.7      | 0.14      | C   | 75.0           | 0.39      | E   | 78.4      | 0.54      | E   | 34.6      | 0.21      | C   |                                |           |     |           |           |     |           |           |     |  |
| WB TH/RT                                                   | 65.3                | 0.10      | E   | 64.2      | 0.02      | E   | 23.8      | 0.02      | C   | 64.1           | 0.10      | E   | 62.5      | 0.03      | E   | 29.9      | 0.03      | C   |                                |           |     |           |           |     |           |           |     |  |
| SB LT                                                      | 82.7                | 0.67      | F   | 90.9      | 0.77      | F   | 35.3      | 0.53      | D   | 82.9           | 0.69      | F   | 89.0      | 0.78      | F   | 42.4      | 0.58      | D   |                                |           |     |           |           |     |           |           |     |  |
| SB TH                                                      | 8.2                 | 0.44      | A   | 13.3      | 0.58      | B   | 12.0      | 0.64      | B   | 10.0           | 0.52      | B   | 18.1      | 0.73      | B   | 13.6      | 0.73      | B   |                                |           |     |           |           |     |           |           |     |  |
| SB RT                                                      | 5.3                 | 0.02      | A   | 7.7       | 0.06      | A   | 7.6       | 0.04      | A   | 6.0            | 0.03      | A   | 8.5       | 0.07      | A   | 7.4       | 0.05      | A   |                                |           |     |           |           |     |           |           |     |  |
| Overall                                                    | 13.7                | -         | B   | 17.3      | -         | B   | 12.4      | -         | B   | 13.9           | -         | B   | 19.9      | -         | B   | 13.6      | -         | B   |                                |           |     |           |           |     |           |           |     |  |
| 7: Honoapiilani Highway & Kaanapali Parkway/Halelo Street  |                     |           |     |           |           |     |           |           |     |                |           |     |           |           |     |           |           |     |                                |           |     |           |           |     |           |           |     |  |
| NB LT                                                      | 35.8                | 0.72      | D   | 75.6      | 0.83      | E   | 42.2      | 0.67      | D   | 45.6           | 0.77      | D   | 93.1      | 0.85      | F   | 60.2      | 0.74      | E   | 40.7                           | 0.75      | D   | 91.4      | 0.85      | F   | 49.6      | 0.71      | D   |  |
| NB TH/RT                                                   | 16.1                | 0.62      | B   | 22.0      | 0.61      | C   | 15.4      | 0.51      | B   | 19.0           | 0.70      | B   | 22.9      | 0.67      | C   | 18.4      | 0.59      | B   | 16.2                           | 0.68      | B   | 22.0      | 0.66      | C   | 13.7      | 0.56      | B   |  |
| EB LT/TH                                                   | 37.9                | 0.57      | D   | 71.4      | 0.83      | E   | 39.5      | 0.69      | D   | 48.2           | 0.67      | D   | 195.8     | 1.16      | F*  | 60.0      | 0.79      | E   | 44.2                           | 0.46      | D   | 86.1      | 0.60      | F   | 48.6      | 0.58      | D   |  |
| EB RT                                                      | 23.1                | 0.10      | C   | 47.3      | 0.49      | D   | 26.9      | 0.30      | C   | 28.7           | 0.08      | C   | 66.4      | 0.58      | E   | 38.3      | 0.34      | D   | 28.3                           | 0.08      | C   | 63.9      | 0.51      | E   | 36.4      | 0.34      | D   |  |
| WB LT/TH/RT                                                | 38.9                | 0.16      | D   | 82.1      | 0.18      | F   | 46.5      | 0.22      | D   | 50.1           | 0.18      | D   | 101.9     | 0.23      | F   | 66.3      | 0.36      | E   | 44.7                           | 0.18      | D   | 100.0     | 0.23      | F   | 54.7      | 0.32      | D   |  |
| SB LT                                                      | 40.2                | 0.31      | D   | 84.8      | 0.57      | F   | 44.5      | 0.22      | D   | 51.8           | 0.59      | D   | 115.3     | 0.73      | F   | 65.4      | 0.55      | E   | 46.2                           | 0.57      | D   | 112.3     | 0.72      | F   | 53.9      | 0.50      | D   |  |
| SB TH                                                      | 22.7                | 0.72      | C   | 37.5      | 0.83      | D   | 22.1      | 0.74      | C   | 25.7           | 0.77      | C   | 42.7      | 0.88      | D   | 27.6      | 0.79      | C   | 22.1                           | 0.75      | C   | 41.1      | 0.88      | D   | 20.8      | 0.76      | C   |  |
| SB RT                                                      | 15.6                | 0.07      | B   | 21.8      | 0.11      | C   | 14.9      | 0.14      | B   | 9.6            | 0.08      | A   | 20.1      | 0.12      | C   | 16.7      | 0.15      | B   | 9.8                            | 0.08      | A   | 8.2       | 0.11      | A   | 6.9       | 0.13      | A   |  |
| Overall                                                    | 23.0                | -         | C   | 40.0      | -         | D   | 23.6      | -         | C   | 27.0           | -         | C   | 53.8      | -         | D   | 30.7      | -         | C   | 23.7                           | -         | C   | 44.8      | -         | D   | 24.1      | -         | C   |  |
| 8: Honoapiilani Highway & Leialii Parkway                  |                     |           |     |           |           |     |           |           |     |                |           |     |           |           |     |           |           |     |                                |           |     |           |           |     |           |           |     |  |
| NB LT                                                      | 81.1                | 0.43      | F   | 71.1      | 0.49      | E   | 83.4      | 0.42      | F   | 75.8           | 0.45      | E   | 69.1      | 0.50      | E   | 72.4      | 0.44      | E   | Same as Base Year 2022         |           |     |           |           |     |           |           |     |  |
| NB TH/RT                                                   | 7.2                 | 0.60      | A   | 9.2       | 0.65      | A   | 2.0       | 0.49      | A   | 8.8            | 0.70      | A   | 2.4       | 0.75      | A   | 2.9       | 0.60      | A   |                                |           |     |           |           |     |           |           |     |  |
| EB LT/TH/RT                                                | 58.7                | 0.02      | E   | 57.1      | 0.05      | E   | 50.4      | 0.01      | D   | 58.6           | 0.06      | E   | 57.0      | 0.07      | E   | 50.0      | 0.03      | D   |                                |           |     |           |           |     |           |           |     |  |
| WB LT                                                      | 62.2                | 0.36      | E   | 62.8      | 0.53      | E   | 58.4      | 0.62      | E   | 62.0           | 0.37      | E   | 62.5      | 0.54      | E   | 58.1      | 0.63      | E   |                                |           |     |           |           |     |           |           |     |  |
| WB TH/RT                                                   | 58.9                | 0.01      | E   | 57.1      | 0.04      | E   | 50.7      | 0.03      | D   | 58.6           | 0.01      | E   | 56.7      | 0.05      | E   | 50.3      | 0.05      | D   |                                |           |     |           |           |     |           |           |     |  |
| SB LT                                                      | 67.8                | 0.43      | E   | 66.4      | 0.76      | E   | 69.6      | 0.76      | E   | 68.8           | 0.52      | E   | 66.2      | 0.78      | E   | 76.2      | 0.79      | E   |                                |           |     |           |           |     |           |           |     |  |
| SB TH/RT                                                   | 4.3                 | 0.43      | A   | 8.7       | 0.72      | A   | 7.7       | 0.60      | A   | 5.2            | 0.51      | A   | 13.3      | 0.83      | B   | 10.2      | 0.70      | B   |                                |           |     |           |           |     |           |           |     |  |
| Overall                                                    | 7.8                 | -         | A   | 11.6      | -         | B   | 9.4       | -         | A   | 9.1            | -         | A   | 10.8      | -         | B   | 11.0      | -         | B   |                                |           |     |           |           |     |           |           |     |  |
| 9: Honoapiilani Highway & Front Street/Flemming Road       |                     |           |     |           |           |     |           |           |     |                |           |     |           |           |     |           |           |     |                                |           |     |           |           |     |           |           |     |  |
| NB LT                                                      | 122.6               | 0.70      | F   | 101.6     | 0.74      | F   | 95.2      | 0.83      | F   | 89.8           | 0.73      | F   | 96.3      | 0.74      | F   | 87.9      | 0.84      | F   | Same as Base Year 2022         |           |     |           |           |     |           |           |     |  |
| NB TH/RT                                                   | 6.2                 | 0.57      | A   | 1.5       | 0.60      | A   | 13.0      | 0.40      | B   | 7.6            | 0.67      | A   | 1.9       | 0.71      | A   | 16.3      | 0.50      | B   |                                |           |     |           |           |     |           |           |     |  |
| EB LT/TH/RT                                                | 52.2                | 0.43      | D   | 59.0      | 0.70      | E   | 58.8      | 0.62      | E   | 52.6           | 0.48      | D   | 59.5      | 0.72      | E   | 57.7      | 0.66      | E   |                                |           |     |           |           |     |           |           |     |  |
| WB LT/TH/RT                                                | 54.4                | 0.60      | D   | 51.5      | 0.25      | D   | 54.5      | 0.33      | D   | 54.3           | 0.61      | D   | 49.7      | 0.24      | D   | 52.3      | 0.32      | D   |                                |           |     |           |           |     |           |           |     |  |
| SB LT                                                      | 93.5                | 0.76      | F   | 119.3     | 0.70      | F   | 93.2      | 0.78      | F   | 88.2           | 0.81      | F   | 87.4      | 0.74      | F   | 88.0      | 0.82      | F   |                                |           |     |           |           |     |           |           |     |  |
| SB TH                                                      | 4.3                 | 0.41      | A   | 8.8       | 0.67      | A   | 5.6       | 0.53      | A   | 4.9            | 0.48      | A   | 11.8      | 0.79      | B   | 7.7       | 0.64      | A   |                                |           |     |           |           |     |           |           |     |  |
| SB RT                                                      | 3.0                 | 0.10      | A   | 4.9       | 0.20      | A   | 3.5       | 0.15      | A   | 3.2            | 0.11      | A   | 5.6       | 0.24      | A   | 4.3       | 0.17      | A   |                                |           |     |           |           |     |           |           |     |  |
| Overall                                                    | 9.1                 | -         | A   | 8.9       | -         | A   | 12.5      | -         | B   | 9.9            | -         | A   | 10.4      | -         | B   | 14.8      | -         | B   |                                |           |     |           |           |     |           |           |     |  |

Table 4.3: Existing Conditions, Base Year 2022 and Base Year 2022 with Mitigation Level of Service Summary Cont'd

| Intersection                                           | Existing Conditions |           |     |           |           |     |           |           |     | Base Year 2022 |           |     |           |           |     |           |           |     | Base Year 2022 with Mitigation |           |     |           |           |     |           |           |     |
|--------------------------------------------------------|---------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|----------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|--------------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|
|                                                        | AM                  |           |     | PM        |           |     | WE        |           |     | AM             |           |     | PM        |           |     | WE        |           |     | AM                             |           |     | PM        |           |     | WE        |           |     |
|                                                        | HCM Delay           | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay      | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay                      | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS |
| <b>10: Honoapiilani Highway &amp; Kapunakea Street</b> |                     |           |     |           |           |     |           |           |     |                |           |     |           |           |     |           |           |     |                                |           |     |           |           |     |           |           |     |
| NB LT                                                  | 79.2                | 0.80      | E   | 67.5      | 0.78      | E   | 70.9      | 0.79      | E   | 74.7           | 0.79      | E   | 67.6      | 0.79      | E   | 71.9      | 0.79      | E   | Same as Base Year 2022         |           |     |           |           |     |           |           |     |
| NB TH/RT                                               | 1.2                 | 0.56      | A   | 1.2       | 0.60      | A   | 0.9       | 0.48      | A   | 1.3            | 0.66      | A   | 1.3       | 0.71      | A   | 2.8       | 0.58      | A   |                                |           |     |           |           |     |           |           |     |
| EB LT/TH                                               | 60.1                | 0.56      | E   | 60.5      | 0.70      | E   | 57.6      | 0.67      | E   | 64.2           | 0.72      | E   | 62.3      | 0.75      | E   | 59.7      | 0.74      | E   |                                |           |     |           |           |     |           |           |     |
| EB RT                                                  | 51.1                | 0.01      | D   | 47.1      | 0.02      | D   | 46.9      | 0.02      | D   | 48.3           | 0.01      | D   | 43.6      | 0.03      | D   | 42.6      | 0.04      | D   |                                |           |     |           |           |     |           |           |     |
| WB LT                                                  | 59.2                | 0.59      | E   | 51.0      | 0.34      | D   | 49.9      | 0.30      | D   | 55.1           | 0.51      | E   | 46.9      | 0.29      | D   | 45.3      | 0.26      | D   |                                |           |     |           |           |     |           |           |     |
| WB TH/RT                                               | 52.1                | 0.11      | D   | 47.7      | 0.09      | D   | 47.4      | 0.08      | D   | 49.3           | 0.10      | D   | 44.1      | 0.08      | D   | 42.9      | 0.07      | D   |                                |           |     |           |           |     |           |           |     |
| SB LT                                                  | 104.5               | 0.79      | F   | 77.3      | 0.80      | E   | 90.6      | 0.85      | F   | 101.8          | 0.83      | F   | 72.4      | 0.80      | E   | 85.2      | 0.84      | F   |                                |           |     |           |           |     |           |           |     |
| SB TH/RT                                               | 7.8                 | 0.47      | A   | 14.8      | 0.74      | B   | 3.3       | 0.64      | A   | 10.3           | 0.56      | B   | 5.5       | 0.89      | A   | 3.6       | 0.78      | A   |                                |           |     |           |           |     |           |           |     |
| Overall                                                | 10.5                | -         | B   | 14.0      | -         | B   | 8.6       | -         | A   | 11.9           | -         | B   | 9.7       | -         | A   | 9.7       | -         | A   |                                |           |     |           |           |     |           |           |     |
| <b>11: Honoapiilani Highway &amp; Keawe Street</b>     |                     |           |     |           |           |     |           |           |     |                |           |     |           |           |     |           |           |     |                                |           |     |           |           |     |           |           |     |
| NB LT                                                  | 74.9                | 0.78      | E   | 67.2      | 0.79      | E   | 62.4      | 0.82      | E   | 79.8           | 0.79      | E   | 69.3      | 0.78      | E   | 64.0      | 0.79      | E   | Same as Base Year 2022         |           |     |           |           |     |           |           |     |
| NB TH                                                  | 24.1                | 0.57      | C   | 41.0      | 0.81      | D   | 34.7      | 0.63      | C   | 32.3           | 0.62      | C   | 39.4      | 0.75      | D   | 31.0      | 0.55      | C   |                                |           |     |           |           |     |           |           |     |
| NB RT                                                  | 17.8                | 0.14      | B   | 29.3      | 0.32      | C   | 29.4      | 0.31      | C   | 23.6           | 0.08      | C   | 28.6      | 0.21      | C   | 25.9      | 0.20      | C   |                                |           |     |           |           |     |           |           |     |
| EB LT/TH                                               | 61.3                | 0.53      | E   | 64.0      | 0.77      | E   | 53.4      | 0.61      | D   | 47.7           | 0.35      | D   | 63.6      | 0.79      | E   | 61.5      | 0.77      | E   |                                |           |     |           |           |     |           |           |     |
| EB RT                                                  | 55.7                | 0.01      | E   | 47.2      | 0.04      | D   | 46.7      | 0.08      | D   | 43.9           | 0.02      | D   | 42.9      | 0.03      | D   | 44.5      | 0.04      | D   |                                |           |     |           |           |     |           |           |     |
| WB LT                                                  | 50.0                | 0.50      | D   | 51.7      | 0.72      | D   | 44.0      | 0.66      | D   | 38.3           | 0.29      | D   | 40.7      | 0.58      | D   | 42.2      | 0.62      | D   |                                |           |     |           |           |     |           |           |     |
| WB TH                                                  | 44.8                | 0.16      | D   | 36.4      | 0.17      | D   | 34.0      | 0.18      | C   | 35.5           | 0.14      | D   | 33.9      | 0.20      | C   | 34.6      | 0.25      | C   |                                |           |     |           |           |     |           |           |     |
| WB RT                                                  | 47.5                | 0.37      | D   | 38.7      | 0.34      | D   | 34.4      | 0.21      | C   | 65.7           | 0.92      | E   | 64.4      | 0.92      | E   | 43.2      | 0.68      | D   |                                |           |     |           |           |     |           |           |     |
| SB LT                                                  | 62.1                | 0.94      | E   | 74.1      | 1.02      | F*  | 73.6      | 0.92      | E   | 51.4           | 0.91      | D   | 46.4      | 0.95      | D   | 62.2      | 0.88      | E   |                                |           |     |           |           |     |           |           |     |
| SB TH/RT                                               | 0.9                 | 0.43      | A   | 2.2       | 0.69      | A   | 42.8      | 0.60      | D   | 1.0            | 0.45      | A   | 1.3       | 0.70      | A   | 41.1      | 0.58      | D   |                                |           |     |           |           |     |           |           |     |
| Overall                                                | 24.3                | -         | C   | 32.1      | -         | C   | 44.4      | -         | D   | 32.1           | -         | C   | 32.2      | -         | C   | 43.9      | -         | D   |                                |           |     |           |           |     |           |           |     |

\* Denotes overcapacity condition, v/c ≥ 1.





## 4.5 Base Year 2027 Analysis

It is anticipated that by Base Year 2027, traffic will have increased over Base Year 2022 conditions due to the continued development of the Lahaina and Kaanapali regions. Actual growth within the study region may vary based upon the actual construction of the various nearby developments.

### 4.5.1 Base Year 2027 Intersection Analysis

By Base Year 2027 without the Project, traffic at the study intersections along Honoapiilani Highway is estimated to generally increase by an additional 5-10% for most parts along the corridor during the AM, PM and WE peak hours of traffic over Base Year 2022 conditions. The majority of study intersections are forecast to operate similar to existing conditions. Overall intersection delays generally increased by only 1-5 seconds at most study intersections from Base Year 2022 conditions. The majority of intersection movements operating at LOS E/F conditions during Base Year 2022 will continue to operate similarly in Base Year 2027.

#### [3] Honoapiilani Highway/Akahele Street

During the PM peak hour, the westbound left-turn movement is expected to experience a significant increase in delay with the increase in through traffic along Honoapiilani Highway. However, because the turning volume is low (10 vehicles), no mitigation is proposed.

#### [7] Honoapiilani Highway/Kaanapali Parkway/Halelo Street

With the proposed developments in the Kaanapali region, delay is expected to increase at this intersection. The intersection will worsen from overall LOS C(D)[C] during Base Year 2022 to LOS C(E)[C] during Base Year 2027. However, the major through movements will continue operating at LOS D or better during all peak hours. No mitigation is proposed beyond Base Year 2022 mitigation.

Figure 4.4 illustrates the Base Year 2027 forecast traffic volumes and LOS for the study intersection movements. Table 4.4 summarizes the Base Year 2027 LOS at the study intersections compared to Base Year 2022 conditions. LOS worksheets are provided in Appendix C. Full Base Year 2022 and 2027 roadway improvements are listed in Appendix D.

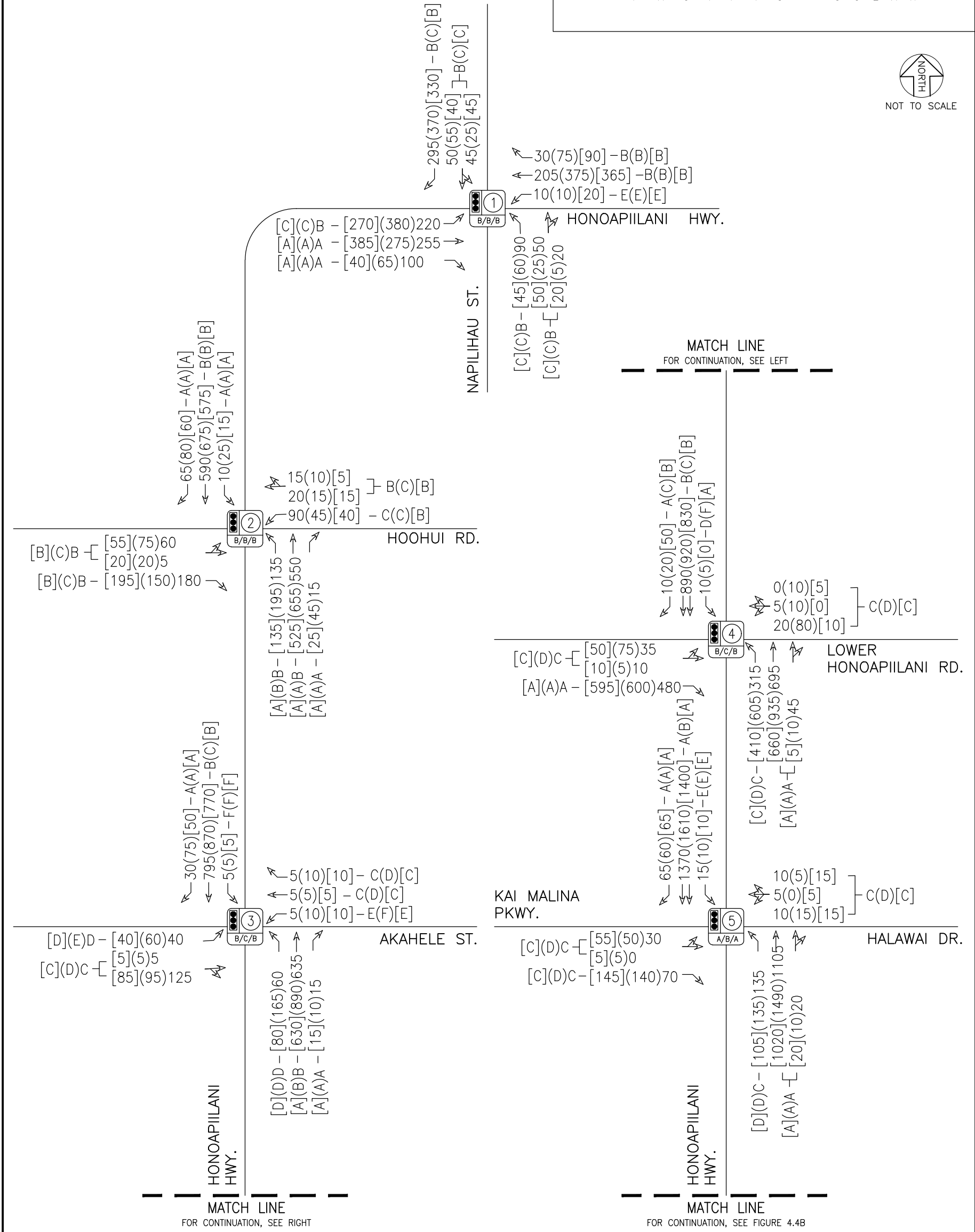
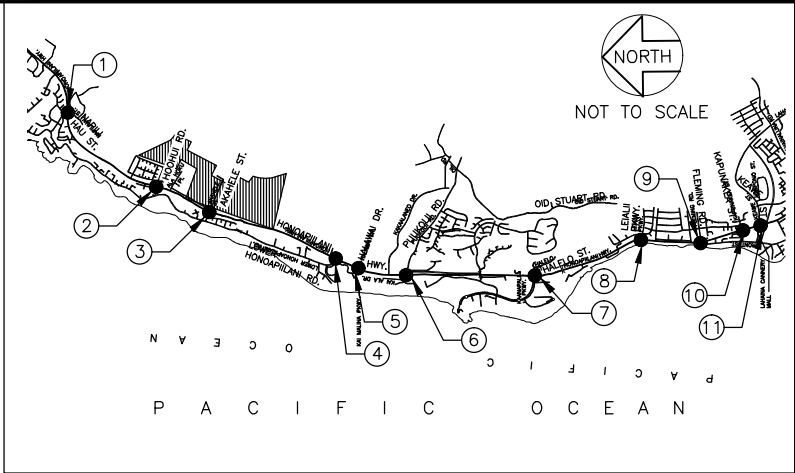
LEGEND

AA(AA)[AA] - AM(PM)[WE] PEAK HOUR OF TRAFFIC VOLUMES

X(X)[X] - AM(PM)[WE] LOS

 - SIGNALIZED INTERSECTION Y, OVERALL AM/PM/WE LOS

**NOTE:**  
THIS DRAWING IS FOR ILLUSTRATIVE  
PURPOSES ONLY. DO NOT USE FOR  
CONSTRUCTION.



|           |                                                                                                                                                                    |        |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| PULELEHUA |  AUSTIN, TSUTSUMI & ASSOCIATES, INC.<br>ENGINEERS, SURVEYORS • HONOLULU, HAWAII | FIGURE |
|           | BASE YEAR 2027 LANE CONFIGURATION, VOLUMES AND LOS                                                                                                                 | 4.4A   |

LEGEND

AA(AA)[AA] - AM(PM)[WE] PEAK HOUR OF TRAFFIC VOLUMES

X(X)[X] - AM(PM)[WE] LOS



- SIGNALIZED INTERSECTION Y, OVERALL AM/PM/WE LOS

NOTE:

THIS DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY. DO NOT USE FOR CONSTRUCTION.

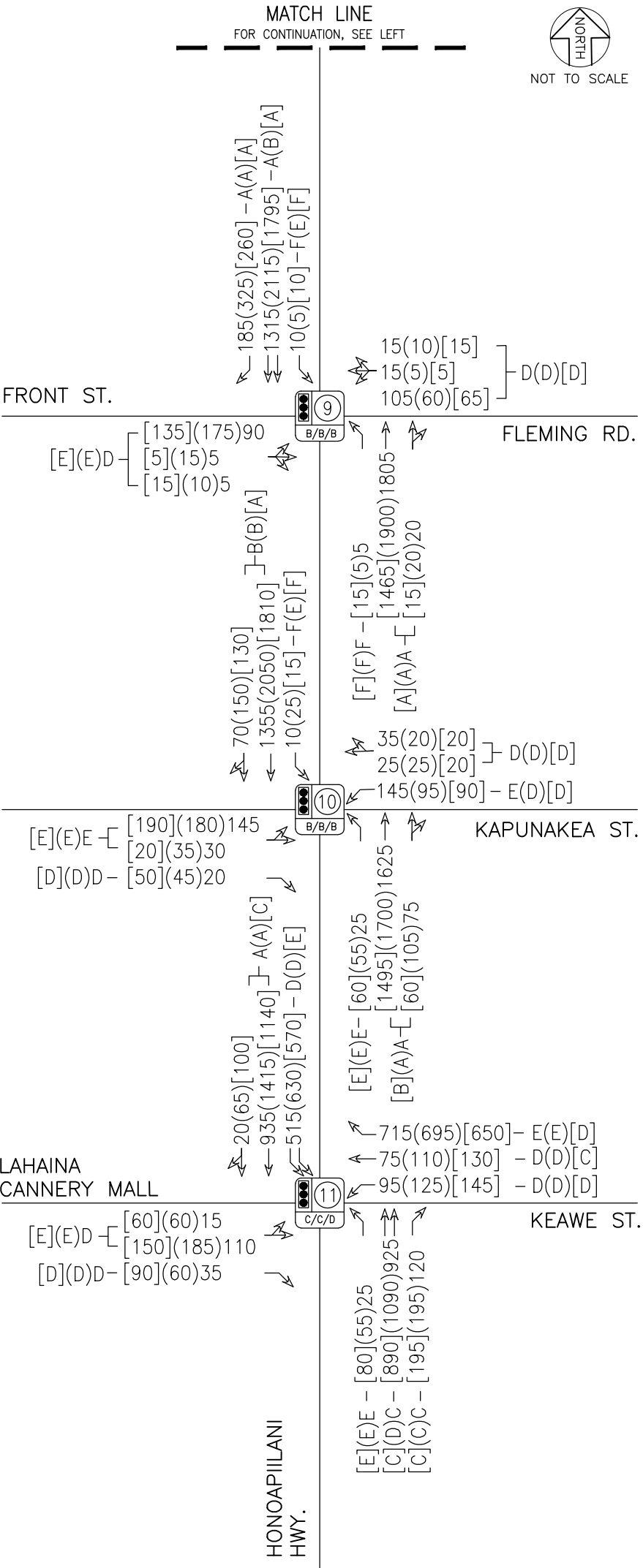
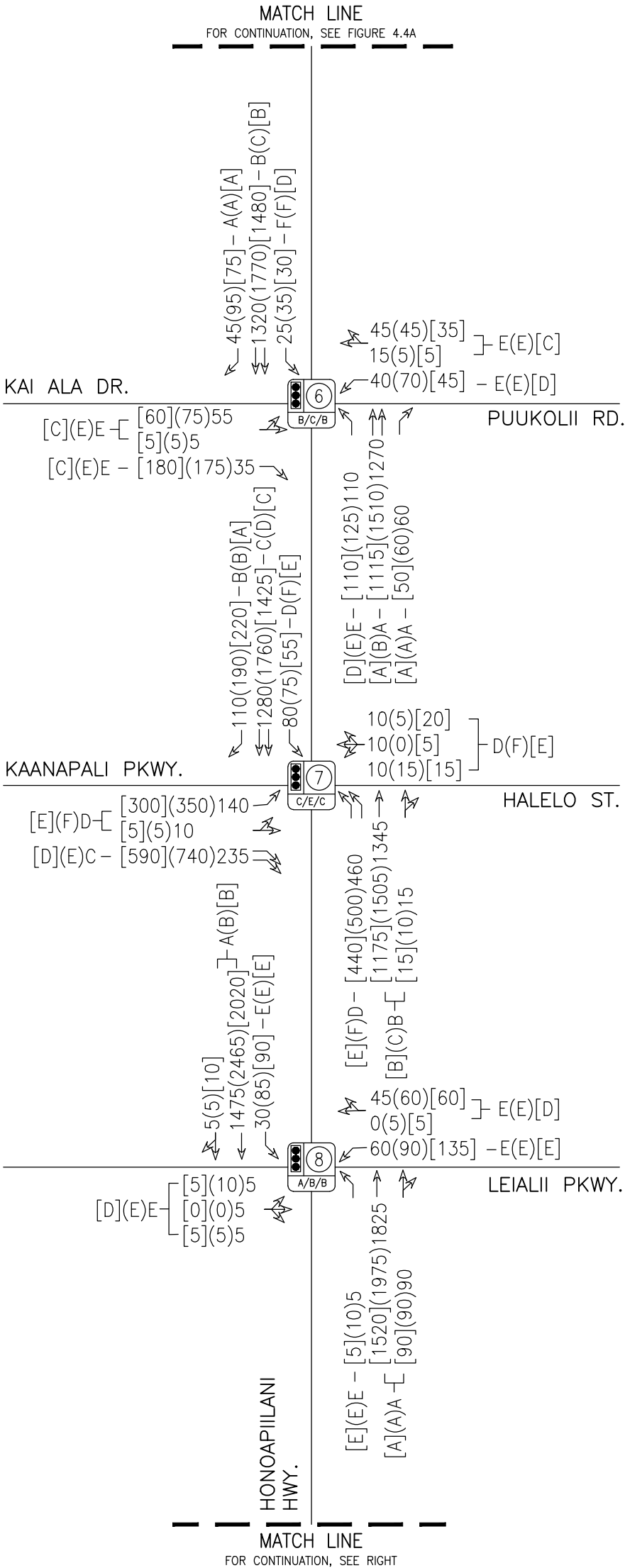
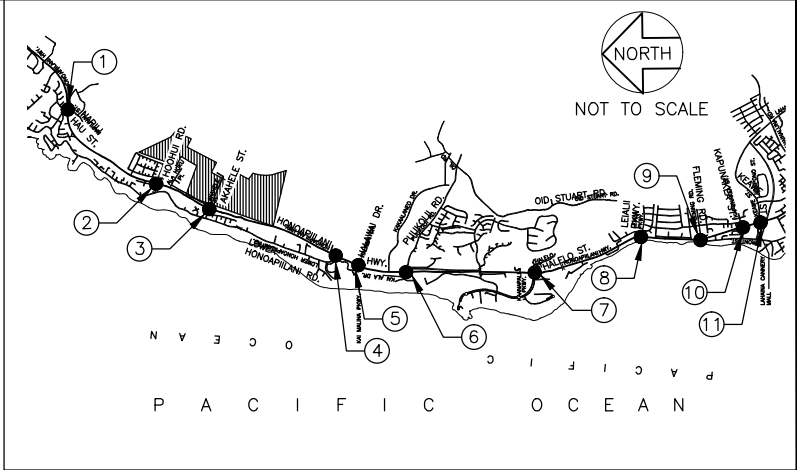


Table 4.4: Base Year 2022 with Mitigation and Base Year 2027 Level of Service Summary

| Intersection                                          | Base Year 2022 with Mitigation |           |     |           |           |     |           |           |     | Base Year 2027 |           |     |           |           |     |           |           |     |
|-------------------------------------------------------|--------------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|----------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|
|                                                       | AM                             |           |     | PM        |           |     | WE        |           |     | AM             |           |     | PM        |           |     | WE        |           |     |
|                                                       | HCM Delay                      | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay      | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS |
| <b>1: Honoapiilani Highway &amp; Napilihau Street</b> |                                |           |     |           |           |     |           |           |     |                |           |     |           |           |     |           |           |     |
| NB LT                                                 | 18.9                           | 0.75      | B   | 19.7      | 0.82      | B   | 19.5      | 0.77      | B   | 18.9           | 0.75      | B   | 23.2      | 0.84      | C   | 22.0      | 0.79      | C   |
| NB TH                                                 | 8.1                            | 0.32      | A   | 6.0       | 0.23      | A   | 7.6       | 0.37      | A   | 8.3            | 0.35      | A   | 5.7       | 0.27      | A   | 7.4       | 0.42      | A   |
| NB RT                                                 | 6.9                            | 0.08      | A   | 5.2       | 0.05      | A   | 5.9       | 0.03      | A   | 6.9            | 0.08      | A   | 4.7       | 0.05      | A   | 5.4       | 0.03      | A   |
| EB LT/TH                                              | 15.0                           | 0.26      | B   | 20.4      | 0.29      | C   | 17.8      | 0.28      | B   | 15.0           | 0.26      | B   | 24.2      | 0.32      | C   | 20.7      | 0.32      | C   |
| EB RT                                                 | 14.5                           | 0.16      | B   | 19.5      | 0.13      | B   | 17.2      | 0.18      | B   | 14.5           | 0.15      | B   | 22.8      | 0.12      | C   | 19.7      | 0.16      | B   |
| WB LT                                                 | 17.4                           | 0.30      | B   | 22.8      | 0.28      | C   | 19.5      | 0.18      | B   | 17.4           | 0.30      | B   | 27.2      | 0.32      | C   | 22.7      | 0.21      | C   |
| WB TH/RT                                              | 14.7                           | 0.22      | B   | 19.4      | 0.13      | B   | 17.7      | 0.27      | B   | 14.7           | 0.22      | B   | 22.9      | 0.14      | C   | 20.3      | 0.29      | C   |
| SB LT                                                 | 66.8                           | 0.72      | E   | 73.0      | 0.73      | E   | 55.6      | 0.77      | E   | 66.8           | 0.72      | E   | 78.4      | 0.74      | E   | 60.2      | 0.78      | E   |
| SB TH                                                 | 12.9                           | 0.31      | B   | 17.9      | 0.60      | B   | 15.2      | 0.57      | B   | 14.2           | 0.47      | B   | 18.7      | 0.66      | B   | 15.5      | 0.62      | B   |
| SB RT                                                 | 11.2                           | 0.02      | B   | 13.1      | 0.05      | B   | 11.4      | 0.06      | B   | 11.2           | 0.02      | B   | 12.8      | 0.05      | B   | 10.9      | 0.06      | B   |
| Overall                                               | 14.2                           | -         | B   | 16.7      | -         | B   | 15.1      | -         | B   | 14.3           | -         | B   | 18.1      | -         | B   | 15.7      | -         | B   |
| <b>2: Honoapiilani Highway &amp; Hoohui Road</b>      |                                |           |     |           |           |     |           |           |     |                |           |     |           |           |     |           |           |     |
| NB LT                                                 | 9.8                            | 0.36      | A   | 9.2       | 0.47      | A   | 8.4       | 0.33      | A   | 10.7           | 0.39      | B   | 11.1      | 0.53      | B   | 8.8       | 0.36      | A   |
| NB TH                                                 | 10.8                           | 0.64      | B   | 9.3       | 0.66      | A   | 8.9       | 0.57      | A   | 10.7           | 0.64      | B   | 9.4       | 0.68      | A   | 8.9       | 0.61      | A   |
| NB RT                                                 | 0.0                            | 0.00      | A   | 0.0       | 0.00      | A   | 0.0       | 0.00      | A   | 0.0            | 0.00      | A   | 0.0       | 0.00      | A   | 0.0       | 0.00      | A   |
| EB LT/TH                                              | 17.3                           | 0.17      | B   | 19.9      | 0.31      | B   | 16.3      | 0.22      | B   | 19.1           | 0.18      | B   | 22.7      | 0.33      | C   | 18.3      | 0.24      | B   |
| EB RT                                                 | 16.3                           | 0.06      | B   | 18.4      | 0.07      | B   | 15.6      | 0.10      | B   | 18.0           | 0.06      | B   | 20.9      | 0.06      | C   | 17.4      | 0.08      | B   |
| WB LT                                                 | 19.9                           | 0.28      | B   | 22.0      | 0.20      | C   | 17.7      | 0.14      | B   | 22.0           | 0.30      | C   | 25.1      | 0.22      | C   | 19.9      | 0.15      | B   |
| WB TH/RT                                              | 16.3                           | 0.07      | B   | 18.3      | 0.07      | B   | 15.5      | 0.06      | B   | 18.0           | 0.07      | B   | 20.9      | 0.07      | C   | 17.4      | 0.07      | B   |
| SB LT                                                 | 9.7                            | 0.03      | A   | 8.1       | 0.07      | A   | 8.0       | 0.04      | A   | 9.5            | 0.03      | A   | 8.1       | 0.07      | A   | 7.7       | 0.04      | A   |
| SB TH                                                 | 15.1                           | 0.77      | B   | 13.2      | 0.77      | B   | 12.5      | 0.73      | B   | 15.7           | 0.81      | B   | 13.9      | 0.82      | B   | 12.7      | 0.77      | B   |
| SB RT                                                 | 9.5                            | 0.05      | A   | 8.0       | 0.06      | A   | 8.1       | 0.04      | A   | 9.2            | 0.04      | A   | 7.6       | 0.06      | A   | 7.5       | 0.04      | A   |
| Overall                                               | 13.3                           | -         | B   | 11.8      | -         | B   | 11.1      | -         | B   | 13.8           | -         | B   | 12.6      | -         | B   | 11.4      | -         | B   |
| <b>3: Honoapiilani Highway &amp; Akahele Street</b>   |                                |           |     |           |           |     |           |           |     |                |           |     |           |           |     |           |           |     |
| NB LT                                                 | 42.7                           | 0.77      | D   | 42.6      | 0.81      | D   | 37.1      | 0.76      | D   | 45.7           | 0.77      | D   | 49.4      | 0.83      | D   | 40.9      | 0.76      | D   |
| NB TH                                                 | 10.6                           | 0.65      | B   | 13.0      | 0.76      | B   | 10.0      | 0.60      | A   | 10.0           | 0.63      | B   | 13.8      | 0.77      | B   | 9.8       | 0.63      | A   |
| NB RT                                                 | 6.5                            | 0.01      | A   | 5.9       | 0.01      | A   | 6.4       | 0.01      | A   | 6.0            | 0.01      | A   | 5.2       | 0.01      | A   | 5.8       | 0.01      | A   |
| EB LT                                                 | 44.0                           | 0.72      | D   | 52.9      | 0.77      | D   | 42.6      | 0.71      | D   | 49.7           | 0.74      | D   | 59.0      | 0.77      | E   | 49.1      | 0.74      | D   |
| EB TH/RT                                              | 24.0                           | 0.08      | C   | 32.8      | 0.04      | C   | 23.8      | 0.06      | C   | 27.2           | 0.07      | C   | 38.8      | 0.05      | D   | 27.5      | 0.05      | C   |
| WB LT                                                 | 69.5                           | 0.53      | E   | 65.8      | 0.58      | E   | 51.3      | 0.55      | D   | 73.5           | 0.53      | E   | 109.1     | 0.78      | F   | 56.1      | 0.56      | E   |
| WB TH                                                 | 25.3                           | 0.03      | C   | 35.5      | 0.03      | D   | 24.8      | 0.03      | C   | 28.7           | 0.03      | C   | 42.2      | 0.04      | D   | 28.7      | 0.03      | C   |
| WB RT                                                 | 25.2                           | 0.01      | C   | 35.4      | 0.01      | D   | 24.7      | 0.01      | C   | 28.5           | 0.01      | C   | 42.1      | 0.01      | D   | 28.6      | 0.01      | C   |
| SB LT                                                 | 112.0                          | 0.71      | F   | 126.5     | 0.72      | F   | 110.8     | 0.70      | F   | 116.5          | 0.71      | F   | 134.9     | 0.72      | F   | 116.1     | 0.71      | F   |
| SB TH                                                 | 15.3                           | 0.84      | B   | 22.9      | 0.88      | C   | 15.5      | 0.83      | B   | 15.8           | 0.86      | B   | 29.0      | 0.92      | C   | 16.1      | 0.85      | B   |
| SB RT                                                 | 7.8                            | 0.02      | A   | 10.6      | 0.05      | B   | 8.3       | 0.03      | A   | 7.3            | 0.02      | A   | 9.9       | 0.05      | A   | 7.8       | 0.04      | A   |
| Overall                                               | 15.7                           | -         | B   | 21.5      | -         | C   | 15.8      | -         | B   | 15.9           | -         | B   | 25.2      | -         | C   | 16.1      | -         | B   |

Table 4.4: Base Year 2022 with Mitigation and Base Year 2027 Level of Service Summary Cont'd

| Intersection                                                          | Base Year 2022 with Mitigation |           |     |           |           |     |           |           |     | Base Year 2027 |           |     |           |           |     |           |           |     |
|-----------------------------------------------------------------------|--------------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|----------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|
|                                                                       | AM                             |           |     | PM        |           |     | WE        |           |     | AM             |           |     | PM        |           |     | WE        |           |     |
|                                                                       | HCM Delay                      | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay      | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS |
| <b>4: Honoapiilani Highway &amp; Lower Honoapiilani Road</b>          |                                |           |     |           |           |     |           |           |     |                |           |     |           |           |     |           |           |     |
| NB LT                                                                 | 22.4                           | 0.83      | C   | 30.0      | 0.94      | C   | 21.2      | 0.87      | C   | 24.4           | 0.84      | C   | 38.4      | 0.95      | D   | 23.7      | 0.88      | C   |
| NB TH/RT                                                              | 4.7                            | 0.33      | A   | 4.4       | 0.36      | A   | 2.4       | 0.24      | A   | 4.5            | 0.33      | A   | 4.3       | 0.37      | A   | 2.3       | 0.26      | A   |
| EB LT/TH                                                              | 25.0                           | 0.19      | C   | 41.7      | 0.38      | D   | 26.8      | 0.28      | C   | 27.2           | 0.21      | C   | 48.5      | 0.42      | D   | 30.0      | 0.31      | C   |
| EB RT                                                                 | 0.0                            | 0.00      | A   | 0.0       | 0.00      | A   | 0.0       | 0.00      | A   | 0.0            | 0.00      | A   | 0.0       | 0.00      | A   | 0.0       | 0.00      | A   |
| WB LT/TH/RT                                                           | 24.4                           | 0.10      | C   | 42.5      | 0.47      | D   | 25.3      | 0.05      | C   | 26.6           | 0.11      | C   | 49.4      | 0.50      | D   | 28.3      | 0.05      | C   |
| SB LT                                                                 | 50.7                           | 0.74      | D   | 87.3      | 0.72      | F   | 0.0       | 0.00      | A   | 53.6           | 0.74      | D   | 95.5      | 0.73      | F   | 0.0       | 0.00      | A   |
| SB TH                                                                 | 13.0                           | 0.58      | B   | 27.4      | 0.70      | C   | 14.7      | 0.58      | B   | 13.3           | 0.60      | B   | 30.2      | 0.74      | C   | 15.3      | 0.61      | B   |
| SB RT                                                                 | 9.2                            | 0.00      | A   | 19.5      | 0.01      | B   | 11.0      | 0.03      | B   | 9.1            | 0.00      | A   | 20.6      | 0.01      | C   | 10.9      | 0.03      | B   |
| Overall                                                               | 12.0                           | -         | B   | 20.9      | -         | C   | 12.6      | -         | B   | 12.5           | -         | B   | 24.2      | -         | C   | 13.2      | -         | B   |
| <b>5: Honoapiilani Highway &amp; Kai Malina Parkway/Halawai Drive</b> |                                |           |     |           |           |     |           |           |     |                |           |     |           |           |     |           |           |     |
| NB LT                                                                 | 31.8                           | 0.79      | C   | 43.8      | 0.82      | D   | 35.3      | 0.78      | D   | 34.6           | 0.80      | C   | 47.4      | 0.82      | D   | 38.4      | 0.78      | D   |
| NB TH/RT                                                              | 4.1                            | 0.45      | A   | 7.1       | 0.60      | A   | 4.9       | 0.41      | A   | 3.9            | 0.45      | A   | 7.2       | 0.61      | A   | 4.8       | 0.43      | A   |
| EB LT/TH                                                              | 30.4                           | 0.16      | C   | 37.0      | 0.22      | D   | 30.2      | 0.25      | C   | 33.3           | 0.17      | C   | 40.2      | 0.23      | D   | 33.2      | 0.27      | C   |
| EB RT                                                                 | 30.3                           | 0.01      | C   | 36.2      | 0.03      | D   | 29.5      | 0.04      | C   | 33.1           | 0.01      | C   | 39.3      | 0.03      | D   | 32.4      | 0.04      | C   |
| WB LT/TH/RT                                                           | 30.9                           | 0.11      | C   | 38.1      | 0.08      | D   | 29.5      | 0.10      | C   | 33.6           | 0.11      | C   | 41.5      | 0.09      | D   | 32.6      | 0.11      | C   |
| SB LT                                                                 | 53.5                           | 0.78      | D   | 73.1      | 0.78      | E   | 59.7      | 0.75      | E   | 57.5           | 0.79      | E   | 77.9      | 0.78      | E   | 63.9      | 0.76      | E   |
| SB TH                                                                 | 7.7                            | 0.61      | A   | 12.5      | 0.72      | B   | 8.8       | 0.63      | A   | 7.9            | 0.64      | A   | 13.8      | 0.76      | B   | 9.1       | 0.66      | A   |
| SB RT                                                                 | 4.5                            | 0.04      | A   | 6.4       | 0.04      | A   | 5.1       | 0.04      | A   | 4.4            | 0.04      | A   | 6.4       | 0.04      | A   | 4.9       | 0.04      | A   |
| Overall                                                               | 8.1                            | -         | A   | 12.1      | -         | B   | 9.3       | -         | A   | 8.2            | -         | A   | 12.9      | -         | B   | 9.5       | -         | A   |
| <b>6: Honoapiilani Highway &amp; Kai Ala Drive/Puukolii Road</b>      |                                |           |     |           |           |     |           |           |     |                |           |     |           |           |     |           |           |     |
| NB LT                                                                 | 74.0                           | 0.85      | E   | 78.1      | 0.86      | E   | 39.8      | 0.78      | D   | 74.2           | 0.85      | E   | 77.9      | 0.86      | E   | 41.8      | 0.78      | D   |
| NB TH                                                                 | 6.2                            | 0.48      | A   | 9.8       | 0.58      | A   | 8.2       | 0.49      | A   | 6.4            | 0.50      | A   | 10.3      | 0.62      | B   | 8.3       | 0.52      | A   |
| NB RT                                                                 | 3.8                            | 0.04      | A   | 5.4       | 0.04      | A   | 5.5       | 0.03      | A   | 3.8            | 0.04      | A   | 5.3       | 0.04      | A   | 5.3       | 0.03      | A   |
| EB LT/TH                                                              | 68.7                           | 0.38      | E   | 67.2      | 0.37      | E   | 31.3      | 0.23      | C   | 68.7           | 0.38      | E   | 67.2      | 0.37      | E   | 33.3      | 0.24      | C   |
| EB RT                                                                 | 63.3                           | 0.01      | E   | 63.7      | 0.13      | E   | 30.1      | 0.05      | C   | 63.3           | 0.01      | E   | 63.7      | 0.13      | E   | 32.0      | 0.05      | C   |
| WB LT                                                                 | 75.0                           | 0.39      | E   | 78.4      | 0.54      | E   | 34.6      | 0.21      | C   | 75.0           | 0.39      | E   | 78.4      | 0.54      | E   | 36.9      | 0.23      | D   |
| WB TH/RT                                                              | 64.1                           | 0.10      | E   | 62.5      | 0.03      | E   | 29.9      | 0.03      | C   | 64.1           | 0.10      | E   | 62.5      | 0.03      | E   | 31.8      | 0.03      | C   |
| SB LT                                                                 | 82.9                           | 0.69      | F   | 89.0      | 0.78      | F   | 42.4      | 0.58      | D   | 82.9           | 0.69      | F   | 89.0      | 0.78      | F   | 44.6      | 0.59      | D   |
| SB TH                                                                 | 10.0                           | 0.52      | B   | 18.1      | 0.73      | B   | 13.6      | 0.73      | B   | 10.6           | 0.56      | B   | 20.1      | 0.79      | C   | 14.4      | 0.76      | B   |
| SB RT                                                                 | 6.0                            | 0.03      | A   | 8.5       | 0.07      | A   | 7.4       | 0.05      | A   | 6.0            | 0.03      | A   | 8.5       | 0.07      | A   | 7.2       | 0.05      | A   |
| Overall                                                               | 13.9                           | -         | B   | 19.9      | -         | B   | 13.6      | -         | B   | 14.0           | -         | B   | 20.8      | -         | C   | 14.1      | -         | B   |

Table 4.4: Base Year 2022 with Mitigation and Base Year 2027 Level of Service Summary Cont'd

| Intersection                                                         | Base Year 2022 with Mitigation |           |     |           |           |     |           |           |     | Base Year 2027 |           |     |           |           |     |           |           |     |
|----------------------------------------------------------------------|--------------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|----------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|
|                                                                      | AM                             |           |     | PM        |           |     | WE        |           |     | AM             |           |     | PM        |           |     | WE        |           |     |
|                                                                      | HCM Delay                      | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay      | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS |
| <b>7: Honoapiilani Highway &amp; Kaanapali Parkway/Halelo Street</b> |                                |           |     |           |           |     |           |           |     |                |           |     |           |           |     |           |           |     |
| NB LT                                                                | 40.7                           | 0.75      | D   | 91.4      | 0.85      | F   | 49.6      | 0.71      | D   | 46.2           | 0.79      | D   | 108.4     | 0.90      | F   | 66.5      | 0.83      | E   |
| NB TH/RT                                                             | 16.2                           | 0.68      | B   | 22.0      | 0.66      | C   | 13.7      | 0.56      | B   | 15.7           | 0.66      | B   | 21.7      | 0.65      | C   | 16.1      | 0.55      | B   |
| EB LT/TH                                                             | 44.2                           | 0.46      | D   | 86.1      | 0.60      | F   | 48.6      | 0.58      | D   | 51.0           | 0.49      | D   | 111.1     | 0.79      | F   | 64.5      | 0.61      | E   |
| EB RT                                                                | 28.3                           | 0.08      | C   | 63.9      | 0.51      | E   | 36.4      | 0.34      | D   | 32.1           | 0.08      | C   | 74.3      | 0.63      | E   | 44.3      | 0.44      | D   |
| WB LT/TH/RT                                                          | 44.7                           | 0.18      | D   | 100.0     | 0.23      | F   | 54.7      | 0.32      | D   | 51.5           | 0.19      | D   | 116.3     | 0.25      | F   | 77.5      | 0.40      | E   |
| SB LT                                                                | 46.2                           | 0.57      | D   | 112.3     | 0.72      | F   | 53.9      | 0.50      | D   | 53.2           | 0.60      | D   | 139.3     | 0.76      | F   | 76.4      | 0.58      | E   |
| SB TH                                                                | 22.1                           | 0.75      | C   | 41.1      | 0.88      | D   | 20.8      | 0.76      | C   | 24.0           | 0.77      | C   | 54.5      | 0.93      | D   | 31.7      | 0.81      | C   |
| SB RT                                                                | 9.8                            | 0.08      | A   | 8.2       | 0.11      | A   | 6.9       | 0.13      | A   | 10.3           | 0.10      | B   | 11.3      | 0.16      | B   | 9.2       | 0.18      | A   |
| Overall                                                              | 23.7                           | -         | C   | 44.8      | -         | D   | 24.1      | -         | C   | 25.5           | -         | C   | 56.2      | -         | E   | 34.5      | -         | C   |
| <b>8: Honoapiilani Highway &amp; Leialii Parkway</b>                 |                                |           |     |           |           |     |           |           |     |                |           |     |           |           |     |           |           |     |
| NB LT                                                                | 75.8                           | 0.45      | E   | 69.1      | 0.50      | E   | 72.4      | 0.44      | E   | 75.4           | 0.45      | E   | 72.5      | 0.62      | E   | 71.7      | 0.44      | E   |
| NB TH/RT                                                             | 8.8                            | 0.70      | A   | 2.4       | 0.75      | A   | 2.9       | 0.60      | A   | 9.3            | 0.73      | A   | 2.8       | 0.82      | A   | 3.5       | 0.68      | A   |
| EB LT/TH/RT                                                          | 58.6                           | 0.06      | E   | 57.0      | 0.07      | E   | 50.0      | 0.03      | D   | 58.6           | 0.06      | E   | 57.0      | 0.07      | E   | 50.0      | 0.03      | D   |
| WB LT                                                                | 62.0                           | 0.37      | E   | 62.5      | 0.54      | E   | 58.1      | 0.63      | E   | 62.0           | 0.37      | E   | 62.5      | 0.54      | E   | 58.1      | 0.63      | E   |
| WB TH/RT                                                             | 58.6                           | 0.01      | E   | 56.7      | 0.05      | E   | 50.3      | 0.05      | D   | 58.6           | 0.01      | E   | 56.7      | 0.05      | E   | 50.3      | 0.05      | D   |
| SB LT                                                                | 68.8                           | 0.52      | E   | 66.2      | 0.78      | E   | 76.2      | 0.79      | E   | 68.8           | 0.52      | E   | 66.2      | 0.78      | E   | 76.2      | 0.79      | E   |
| SB TH/RT                                                             | 5.2                            | 0.51      | A   | 13.3      | 0.83      | B   | 10.2      | 0.70      | B   | 5.6            | 0.54      | A   | 19.1      | 0.91      | B   | 12.8      | 0.78      | B   |
| Overall                                                              | 9.1                            | -         | A   | 10.8      | -         | B   | 11.0      | -         | B   | 9.4            | -         | A   | 13.9      | -         | B   | 12.2      | -         | B   |
| <b>9: Honoapiilani Highway &amp; Front Street/Fleming Road</b>       |                                |           |     |           |           |     |           |           |     |                |           |     |           |           |     |           |           |     |
| NB LT                                                                | 89.8                           | 0.73      | F   | 96.3      | 0.74      | F   | 87.9      | 0.84      | F   | 88.0           | 0.73      | F   | 93.8      | 0.74      | F   | 85.3      | 0.84      | F   |
| NB TH/RT                                                             | 7.6                            | 0.67      | A   | 1.9       | 0.71      | A   | 16.3      | 0.50      | B   | 8.0            | 0.70      | A   | 2.5       | 0.77      | A   | 7.5       | 0.58      | A   |
| EB LT/TH/RT                                                          | 52.6                           | 0.48      | D   | 59.5      | 0.72      | E   | 57.7      | 0.66      | E   | 52.6           | 0.48      | D   | 59.5      | 0.72      | E   | 57.7      | 0.66      | E   |
| WB LT/TH/RT                                                          | 54.3                           | 0.61      | D   | 49.7      | 0.24      | D   | 52.3      | 0.32      | D   | 54.3           | 0.61      | D   | 49.7      | 0.24      | D   | 52.3      | 0.32      | D   |
| SB LT                                                                | 88.2                           | 0.81      | F   | 87.4      | 0.74      | F   | 88.0      | 0.82      | F   | 87.5           | 0.81      | F   | 79.4      | 0.74      | E   | 84.1      | 0.82      | F   |
| SB TH                                                                | 4.9                            | 0.48      | A   | 11.8      | 0.79      | B   | 7.7       | 0.64      | A   | 5.2            | 0.51      | A   | 13.8      | 0.87      | B   | 8.8       | 0.72      | A   |
| SB RT                                                                | 3.2                            | 0.11      | A   | 5.6       | 0.24      | A   | 4.3       | 0.17      | A   | 3.2            | 0.12      | A   | 5.6       | 0.24      | A   | 4.3       | 0.18      | A   |
| Overall                                                              | 9.9                            | -         | A   | 10.4      | -         | B   | 14.8      | -         | B   | 10.1           | -         | B   | 11.2      | -         | B   | 11.4      | -         | B   |
| <b>10: Honoapiilani Highway &amp; Kapunakea Street</b>               |                                |           |     |           |           |     |           |           |     |                |           |     |           |           |     |           |           |     |
| NB LT                                                                | 74.7                           | 0.79      | E   | 67.6      | 0.79      | E   | 71.9      | 0.79      | E   | 74.0           | 0.79      | E   | 72.5      | 0.79      | E   | 71.1      | 0.78      | E   |
| NB TH/RT                                                             | 1.3                            | 0.66      | A   | 1.3       | 0.71      | A   | 2.8       | 0.58      | A   | 1.4            | 0.69      | A   | 1.2       | 0.76      | A   | 12.2      | 0.66      | B   |
| EB LT/TH                                                             | 64.2                           | 0.72      | E   | 62.3      | 0.75      | E   | 59.7      | 0.74      | E   | 64.2           | 0.72      | E   | 70.5      | 0.80      | E   | 59.7      | 0.74      | E   |
| EB RT                                                                | 48.3                           | 0.01      | D   | 43.6      | 0.03      | D   | 42.6      | 0.04      | D   | 48.3           | 0.01      | D   | 45.1      | 0.02      | D   | 42.6      | 0.04      | D   |
| WB LT                                                                | 55.1                           | 0.51      | E   | 46.9      | 0.29      | D   | 45.3      | 0.26      | D   | 55.1           | 0.51      | E   | 48.5      | 0.31      | D   | 45.3      | 0.26      | D   |
| WB TH/RT                                                             | 49.3                           | 0.10      | D   | 44.1      | 0.08      | D   | 42.9      | 0.07      | D   | 49.3           | 0.10      | D   | 45.7      | 0.09      | D   | 42.9      | 0.07      | D   |
| SB LT                                                                | 101.8                          | 0.83      | F   | 72.4      | 0.80      | E   | 85.2      | 0.84      | F   | 101.0          | 0.83      | F   | 72.5      | 0.80      | E   | 82.3      | 0.84      | F   |
| SB TH/RT                                                             | 10.3                           | 0.56      | B   | 5.5       | 0.89      | A   | 3.6       | 0.78      | A   | 10.9           | 0.59      | B   | 13.4      | 0.96      | B   | 5.4       | 0.87      | A   |
| Overall                                                              | 11.9                           | -         | B   | 9.7       | -         | A   | 9.7       | -         | A   | 11.9           | -         | B   | 14.3      | -         | B   | 13.8      | -         | B   |

Table 4.4: Base Year 2022 with Mitigation and Base Year 2027 Level of Service Summary Cont'd

| Intersection                                       | Base Year 2022 with Mitigation |           |     |           |           |     |           |           |     | Base Year 2027 |           |     |           |           |     |           |           |     |
|----------------------------------------------------|--------------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|----------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|
|                                                    | AM                             |           |     | PM        |           |     | WE        |           |     | AM             |           |     | PM        |           |     | WE        |           |     |
|                                                    | HCM Delay                      | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay      | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS |
| <b>11: Honoapiilani Highway &amp; Keawe Street</b> |                                |           |     |           |           |     |           |           |     |                |           |     |           |           |     |           |           |     |
| NB LT                                              | 79.8                           | 0.79      | E   | 69.3      | 0.78      | E   | 64.0      | 0.79      | E   | 79.8           | 0.79      | E   | 69.3      | 0.78      | E   | 64.0      | 0.79      | E   |
| NB TH                                              | 32.3                           | 0.62      | C   | 39.4      | 0.75      | D   | 31.0      | 0.55      | C   | 33.6           | 0.66      | C   | 42.7      | 0.85      | D   | 33.9      | 0.68      | C   |
| NB RT                                              | 23.6                           | 0.08      | C   | 28.6      | 0.21      | C   | 25.9      | 0.20      | C   | 23.8           | 0.08      | C   | 27.6      | 0.21      | C   | 25.7      | 0.20      | C   |
| EB LT/TH                                           | 47.7                           | 0.35      | D   | 63.6      | 0.79      | E   | 61.5      | 0.77      | E   | 47.3           | 0.34      | D   | 71.3      | 0.84      | E   | 61.6      | 0.77      | E   |
| EB RT                                              | 43.9                           | 0.02      | D   | 42.9      | 0.03      | D   | 44.5      | 0.04      | D   | 43.5           | 0.01      | D   | 44.2      | 0.02      | D   | 44.4      | 0.04      | D   |
| WB LT                                              | 38.3                           | 0.29      | D   | 40.7      | 0.58      | D   | 42.2      | 0.62      | D   | 38.1           | 0.29      | D   | 44.9      | 0.63      | D   | 42.2      | 0.62      | D   |
| WB TH                                              | 35.5                           | 0.14      | D   | 33.9      | 0.20      | C   | 34.6      | 0.25      | C   | 35.3           | 0.14      | D   | 35.2      | 0.21      | D   | 34.6      | 0.25      | C   |
| WB RT                                              | 65.7                           | 0.92      | E   | 64.4      | 0.92      | E   | 43.2      | 0.68      | D   | 76.2           | 0.95      | E   | 79.9      | 0.97      | E   | 43.7      | 0.70      | D   |
| SB LT                                              | 51.4                           | 0.91      | D   | 46.4      | 0.95      | D   | 62.2      | 0.88      | E   | 51.1           | 0.91      | D   | 41.6      | 0.94      | D   | 57.1      | 0.89      | E   |
| SB TH/RT                                           | 1.0                            | 0.45      | A   | 1.3       | 0.70      | A   | 41.1      | 0.58      | D   | 1.1            | 0.49      | A   | 0.8       | 0.79      | A   | 33.3      | 0.69      | C   |
| Overall                                            | 32.1                           | -         | C   | 32.2      | -         | C   | 43.9      | -         | D   | 33.3           | -         | C   | 33.2      | -         | C   | 40.4      | -         | D   |

## 5. FUTURE YEAR SCENARIOS

### 5.1 Background

The Project is located upon approximately 304.255 acres of undeveloped land in Lahaina, bounded by Honoapiilani Highway to the west and the Kapalua Airport to the east. The Project proposes to provide 898 multi-family (MF) residential units, 2 single-family residential lots (for future residential development), an elementary school, a 10-acre park and two (2) retail centers, totaling 70,000 square feet (SF). In addition, a trail will be constructed just east and parallel to Honoapiilani Highway that will provide bike and pedestrian access to link the Project's development north and south of Mahinahina Gulch. The Project will be constructed in six (6) phases, but for purposes of this TIAR, will be analyzed as four (4) scenarios described below.

Although it is not part of this TIAR, the Project envisions future expansion at the north end of the Project site (currently identified as 2 single-family residential lots) with an additional 302 residential units, bringing the total residential unit count to 1,200 residential units. Future traffic analysis and roadway mitigation measures will be assessed at a later date.

Scenario 1 – Develop Phase 1 with a build-out of early 2022 that includes the following:

- 240 MF residential units north of Akahele Street, with direct access provided by two (2) new Project roadways, Road A and Road C, bisecting Akahele Street.

Scenario 2 - Develop Phase 2 with a build-out of early 2022 that includes the following:

- 240 MF residential units south of Akahele Street with direct access provided by Road A and Road C.
- Retail Area North consisting of 50,000 square feet (SF) of space located on the northeast corner of the Honoapiilani Highway/Akahele Street intersection.
- Retail Area South consisting of 20,000 SF of space located adjacent to Retail Area North on the southeast corner of the Honoapiilani Highway/Akahele Street intersection.
  - o Access to Retail Area North and South will be provided by Road A. Retail Area North will also be serviced by a RIRO access via Honoapiilani Highway.
  - o Based on the developer forecast absorption for the Retail Area North and South component, approximately 15,000 SF of retail space will be occupied by Year 2022, with subsequent occupancy occurring at a pace of 5,000 SF of retail space every 2 years thereafter. Therefore, full build-out and occupancy of Retail Areas North and South will likely occur well beyond Year 2022, but was assumed to be fully built out by Year 2022 for this TIAR.

Scenario 3 – Develop Phases 3-5 with a build-out of late 2022 that include the following:

- 100 MF residential units (Phase 3) south of Akahele Street, with access provided by Road C.
- 318 MF residential units (Phase 3 and Phase 4) south of Mahinahina Gulch, with access provided by a new Project roadway, Road J, intersecting Honoapiilani Highway south of Mahinahina Gulch.





- 2 single-family residential lots north of Akahahele Street, with access provided by Road A and Road C.
- 10-acre park; for purposes of this TIAR, assumed two (2) practice fields south of Mahinahina Gulch, with access provided by Road J.

Scenario 4 – A future elementary school, to be planned/developed by the Department of Education (DOE). Since the development of the school is not in the direct controller of the Pulelehua development, the timeframe for this school has yet to be determined. For purposes of this TIAR, a forecast build-out of 2027 was assumed for the TIAR.

- Assumed 750-student elementary school, with access provided by Road A.

### **5.1.1 Travel Demand Estimations**

The State of Hawaii Department of Transportation (HDOT) and Maui County provide various Transportation Demand Management (TDM) programs that promote the use of transit, walking, biking and alternative modes of transportation to reduce the use of single-occupant vehicles on roadways. These TDM measures have only been identified and conservatively assumed to yield NO vehicular reductions for Project generated traffic.

Maui County currently provides a bus system that offers several routes that connect the major areas in Maui. The Lahaina Islander Route #20 provides regional connectivity between Lahaina and Kahului. The Lahaina Villager Route #23, Kaanapali Islander Route #25 and Napili Islander Route #30 provide transportation within the towns of Lahaina, Kaanapali and Napili.

HDOT currently provides the Bike Plan Hawaii Master Plan, which identifies existing and proposed bicycle routes that could potentially be implemented in the future. In the vicinity of the Project, a signed shared roadway is currently provided along the 24.4 mile route along Honoapiilani Highway between Waiale Road in Wailuku and Fleming Beach Park in Kapalua. A signed shared roadway is also proposed along the 5.2 mile stretch of Lower Honoapiilani Highway from Lower Aloe Drive to Honoapiilani Highway.

### **5.1.2 Trip Generation**

The Institute of Transportation Engineers (ITE) publishes a book based on empirical data compiled from a body of more than 4,250 trip generation studies submitted by public agencies, developers, consulting firms, and associations. This publication, titled Trip Generation Manual, 9<sup>th</sup> Edition, provides trip rates and/or formulae based on graphs that correlate vehicular trips with independent variables. The independent variables can range from Dwelling Units (DU) for single-family attached homes to Gross Floor Area (GFA) for commercial or office development. These trip rates/formulae and their associated directional distributions were used to estimate the increase in the number of vehicular trips generated by the proposed Project. The rates selected were based on the land use description.

The Project's mixture of residential and retail land uses interact to create vehicle trips that can be considered internal to the development. Calculation of internal trip capture rates was done using the ITE Trip Generation Handbook, 3<sup>rd</sup> Edition for retail and residential land uses and generally resulted in an approximate 16% internal capture reduction for the PM peak hour. A minimal 1% internal capture reduction was applied to AM peak hour and no reduction for WE peak hour. Pass-by trip reductions were also applied and based upon information within the ITE Trip Generation Handbook. As a conservative measure, a pass-by rate of 20% was applied to the retail component for the PM and WE peak hours of traffic. No pass-by reductions were



applied to the AM peak hour. See Tables 5.1 and 5.2 for Trip Generation formulae and projections for the Project.

### 5.1.3 Trip Distribution and Assignment

Trips generated by the Project were assigned throughout the study area generally based upon existing travel patterns. The traffic generated by the Project was added to the forecast Base Year 2022 and 2027 traffic volumes within the vicinity of the Project to constitute the traffic volumes for Future Year 2022 Scenario 1, 2 and 3 and Future Year 2027 Scenario 4 traffic conditions. Figures 5.1, 5.3, 5.6 and 5.8 illustrate the Project-generated trip distribution for Future Year 2022 Scenario 1, Future Year 2022 Scenario 2, Future Year 2022 Scenario 3 and Future Year 2027 Scenario 4, respectively.

Table 5.1: Trip Generation Rates

| Land Use (ITE Code)                  | Independent Variable | AM Peak Hour |         | PM Peak Hour |         | WE Peak Hour |         |
|--------------------------------------|----------------------|--------------|---------|--------------|---------|--------------|---------|
|                                      |                      | Trip Rate    | % Enter | Trip Rate    | % Enter | Trip Rate    | % Enter |
| Single-Family Detached Housing (210) | Dwelling Units (DU)  | [a]          | 26%     | [b]          | 64%     | [c]          | 54%     |
| Low-Rise Apartment (221)             | Dwelling Units (DU)  | [d]          | 21%     | [e]          | 65%     | [f]          | 54%     |
| Shopping Center (820)                | 1000 SQ FT           | [g]          | 62%     | [h]          | 48%     | [i]          | 52%     |
| Elementary School (520)              | Students             | 0.45         | 55%     | 0.15         | 49%     | 0.00         | 0%      |
| Soccer Complex (480)                 | Fields               | 1.12         | 57%     | 17.70        | 67%     | 30.34        | 48%     |

[a]  $T=0.70(X)+9.74$

[b]  $LN(T)=0.90LN(X)+0.51$

[c]  $T=0.89(X)+8.77$

[d]  $LN(T)=0.82*LN(X)+0.23$

[e]  $LN(T)=0.88*LN(X)+0.16$

[f]  $LN(T)=0.82*LN(X)+0.41$

[g]  $LN(T)=0.61*LN(X)+2.24$

[h]  $LN(T)=0.67*LN(X)+3.31$

[i]  $LN(T)=0.65*LN(X)+3.78$



Table 5.2: Project-Generated Trips

|                                                  | Land Use (ITE Code)                         | Variable     | AM Peak Hour |            |             | PM Peak Hour |            |             | WE Peak Hour |            |             |
|--------------------------------------------------|---------------------------------------------|--------------|--------------|------------|-------------|--------------|------------|-------------|--------------|------------|-------------|
|                                                  |                                             |              | Enter (vph)  | Exit (vph) | Total (vph) | Enter (vph)  | Exit (vph) | Total (vph) | Enter (vph)  | Exit (vph) | Total (vph) |
| Scenario 1<br>(Early 2022)                       | Low-Rise Apartment (221)                    | 240 DU       | 19           | 70         | 89          | 81           | 44         | 125         | 57           | 49         | 106         |
|                                                  | Total NEW External Project Scenario 1Trips  |              | 19           | 70         | 89          | 81           | 44         | 125         | 57           | 49         | 106         |
| Scenario 2<br>(Early 2022)                       | Low-Rise Apartment (221)                    | 240 DU       | 18           | 70         | 88          | 80           | 43         | 124         | 57           | 49         | 106         |
|                                                  | Shopping Center (820)                       | 70000 SQ FT  | 78           | 48         | 125         | 226          | 245        | 472         | 361          | 333        | 694         |
|                                                  | Subtotal                                    |              | 96           | 118        | 213         | 306          | 288        | 596         | 418          | 382        | 800         |
|                                                  | Internal Capture (Residential)              |              | (1)          | (1)        | (2)         | (64)         | (23)       | (87)        | 0            | 0          | 0           |
|                                                  | Internal Capture (Retail)                   |              | (1)          | (1)        | (2)         | (23)         | (64)       | (87)        | 0            | 0          | 0           |
|                                                  | Pass-by (Retail)                            |              | 0            | 0          | 0           | (45)         | (45)       | (90)        | (67)         | (67)       | (134)       |
|                                                  | Total NEW External Project Scenario 2 Trips |              | 94           | 116        | 210         | 175          | 156        | 332         | 351          | 315        | 666         |
| Scenario 3<br>(Late 2022)                        | Single-Family Detached Housing (210)        | 2 DU         | 3            | 8          | 11          | 2            | 1          | 3           | 6            | 5          | 11          |
|                                                  | Low-Rise Apartment (221)                    | 418 DU       | 33           | 122        | 155         | 141          | 76         | 217         | 100          | 85         | 185         |
|                                                  | Soccer Complex (480)                        | 2 Fields     | 1            | 1          | 2           | 15           | 21         | 35          | 35           | 26         | 61          |
|                                                  | Total NEW External Project Scenario 3 Trips |              | 37           | 131        | 168         | 158          | 98         | 255         | 141          | 116        | 257         |
| Scenario 4<br>(2027)                             | Elementary School (520)                     | 750 Students | 186          | 152        | 338         | 55           | 58         | 113         | 0            | 0          | 0           |
|                                                  | Subtotal                                    |              | 186          | 152        | 338         | 55           | 58         | 113         | 0            | 0          | 0           |
|                                                  | Internal Capture (School)                   |              | (19)         | (7)        | (26)        | (6)          | (6)        | (12)        | 0            | 0          | 0           |
|                                                  | Total NEW External Project Scenario 4 Trips |              | 167          | 145        | 312         | 49           | 52         | 101         | 0            | 0          | 0           |
| Total NEW External Project Scenario 1 to 4 Trips |                                             |              | 317          | 462        | 779         | 463          | 350        | 813         | 549          | 480        | 1029        |

## 5.2 Future Year 2022 Scenario 1 Analysis

By completion of Scenario 1 in Future Year 2022, the Project is projected to generate a total of 89(125)[106] new external trips during the AM(PM)[WE] peak hours of traffic. Trips generated by the Project are expected to result in growth along major roadways in the study area. All generated traffic will access the site via Honoapiilani Highway at its intersections with Akahele Street. Due to the relatively minimal traffic increases due to Scenario 1, regional traffic at the study intersections (those not providing direct access to the Project) along Honoapiilani Highway is estimated to increase overall by less than 5%, while local traffic at the study intersections (those providing direct access to the Project) along Honoapiilani Highway is estimated to increase overall by less than 10% from Base Year 2022 without the Project scenario, during the AM, PM and WE peak hours of traffic.

### 5.2.1 Future Year 2022 Scenario 1 Intersection Analysis

All study intersections are forecast to operate similar to Base Year 2022. The majority of intersection movements forecast to operate at LOS E/F for Base Year 2022 conditions will continue to operate similarly with Future Year 2022 Scenario 1 of the Project. The majority of high volume through movements only experienced delay increases ranging from 1-5 seconds.

#### [3] Honoapiilani Highway/Akahele Street

Since this intersection is the exclusive access from Honoapiilani Highway into the Project's Scenario 1 site, turning movements into and out of Akahele Street will increase. As a result, the intersection will worsen from Base Year 2022, but will continue to operate adequately at overall LOS B(C)[B] for the Future Year 2022 Scenario 1. Various left-turn movements will continue to operate at LOS E/F conditions during all peak hours, mainly due to those left-turn volumes remaining relatively low. It is recommended that the existing signal timing be optimized to accommodate turning movement increases.

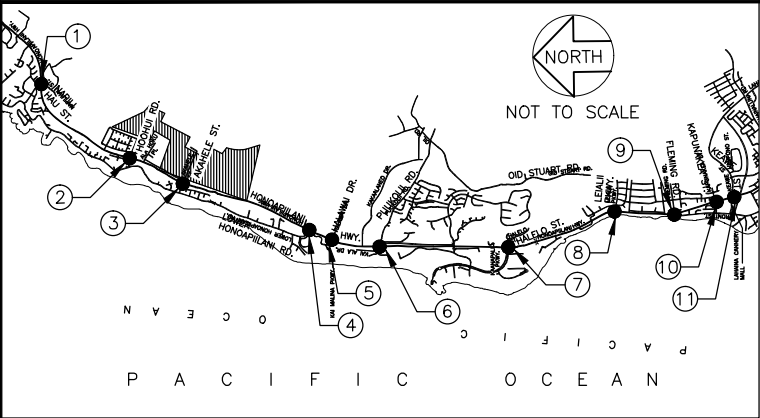
Based on A Policy on Geometric Design of Highways and Streets, by the American Association of State Highway and Transportation Officials, dated 2011 (hereinafter referred to as the "AASHTO Green Book"), left-turn storage lane lengths at the Honoapiilani Highway/Akahele Street intersection were determined. See Table 5.3 for the recommended storage lane lengths. Based on the AASHTO Green Book, all anticipated left-turn storage at the intersection is currently accommodated, and no extensions will be required upon completion of Scenario 1.

#### [14-15] Akahele Street intersection with Road A and Road C

Akahele Street currently services very low existing traffic, with through volumes under 25 vehicles in each direction for all peak hours of traffic, resulting in lengthy gaps along Akahele Street. With the addition of the Project's bisecting Road A and Road C, forecast through traffic along Akahele Street will continue to operate with low through volumes (under 25 vehicles) at the Road C intersection and slightly higher through volumes, between 30-50 vehicles, at the Road A intersection during all peak hours.

Figures 5.1 illustrate the Project-generated trips for Future Year 2022 Scenario 1. Figure 5.2 illustrates the Future Year 2022 Scenario 1 forecast traffic volumes and LOS for the study intersection movements. Table 5.4 summarizes the Future Year 2022 Scenario 1 LOS at the study intersections compared to Base Year 2022 with mitigation conditions. LOS worksheets are provided in Appendix C.

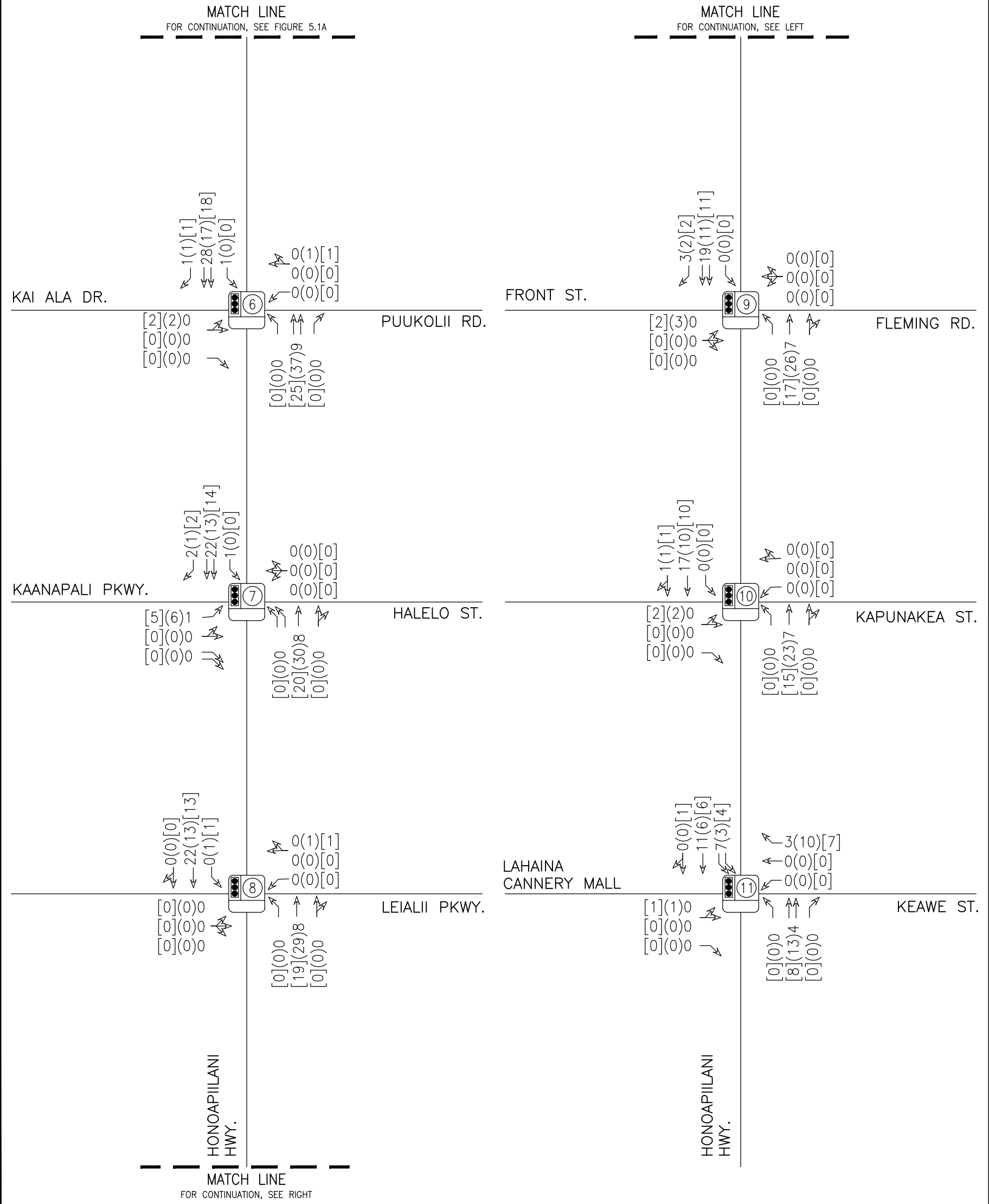




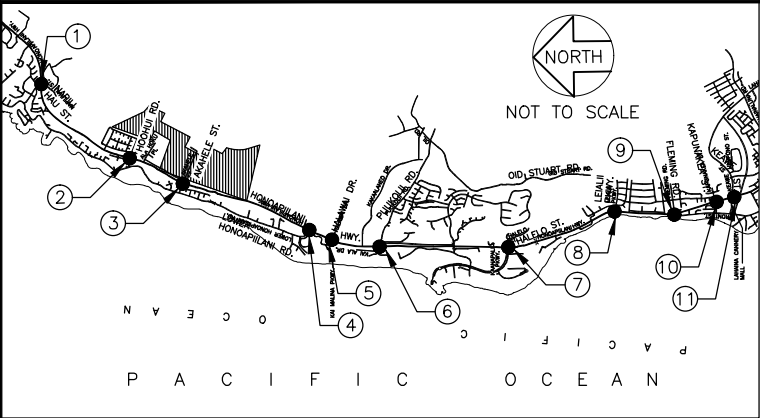
LEGEND

- AA(AA)[AA] - AM(PM)[WE] PEAK HOUR OF TRAFFIC VOLUMES
- SIGNALIZED INTERSECTION Y
- UNSIGNALIZED INTERSECTION X

**NOTE:**  
THIS DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY. DO NOT USE FOR CONSTRUCTION.



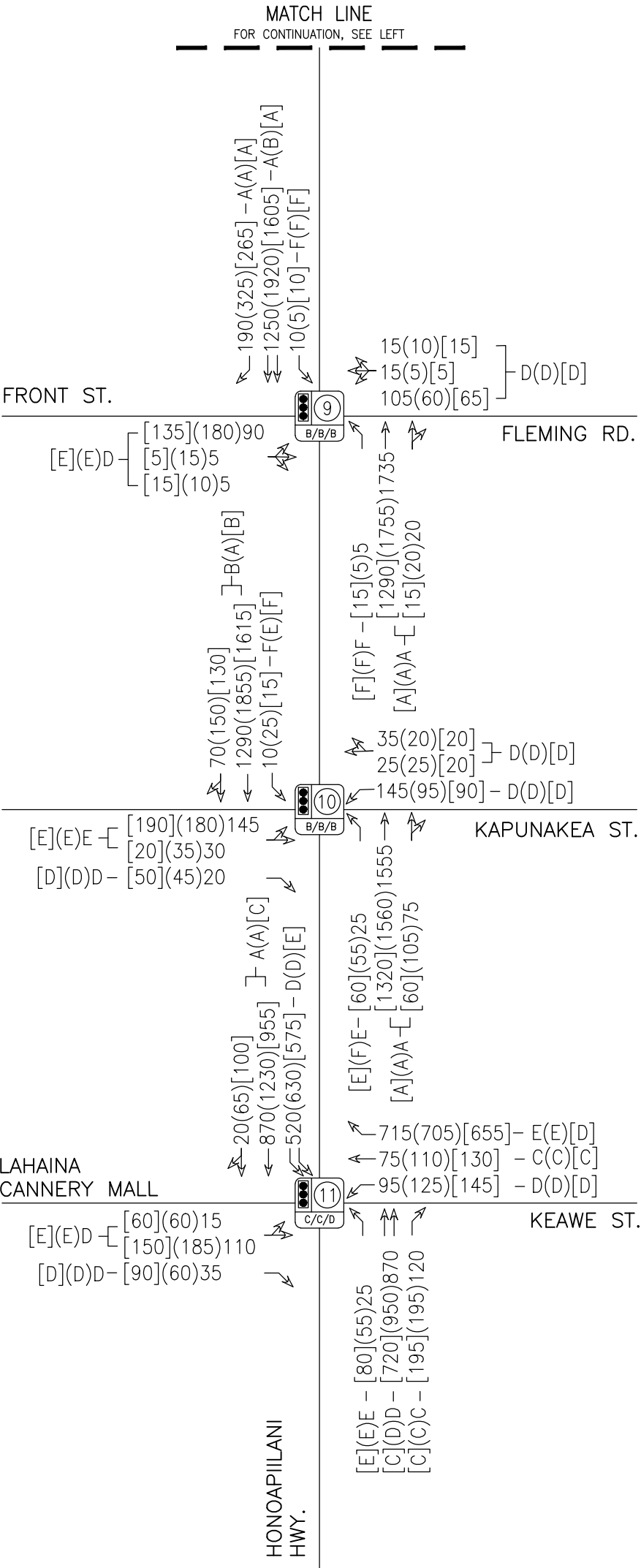
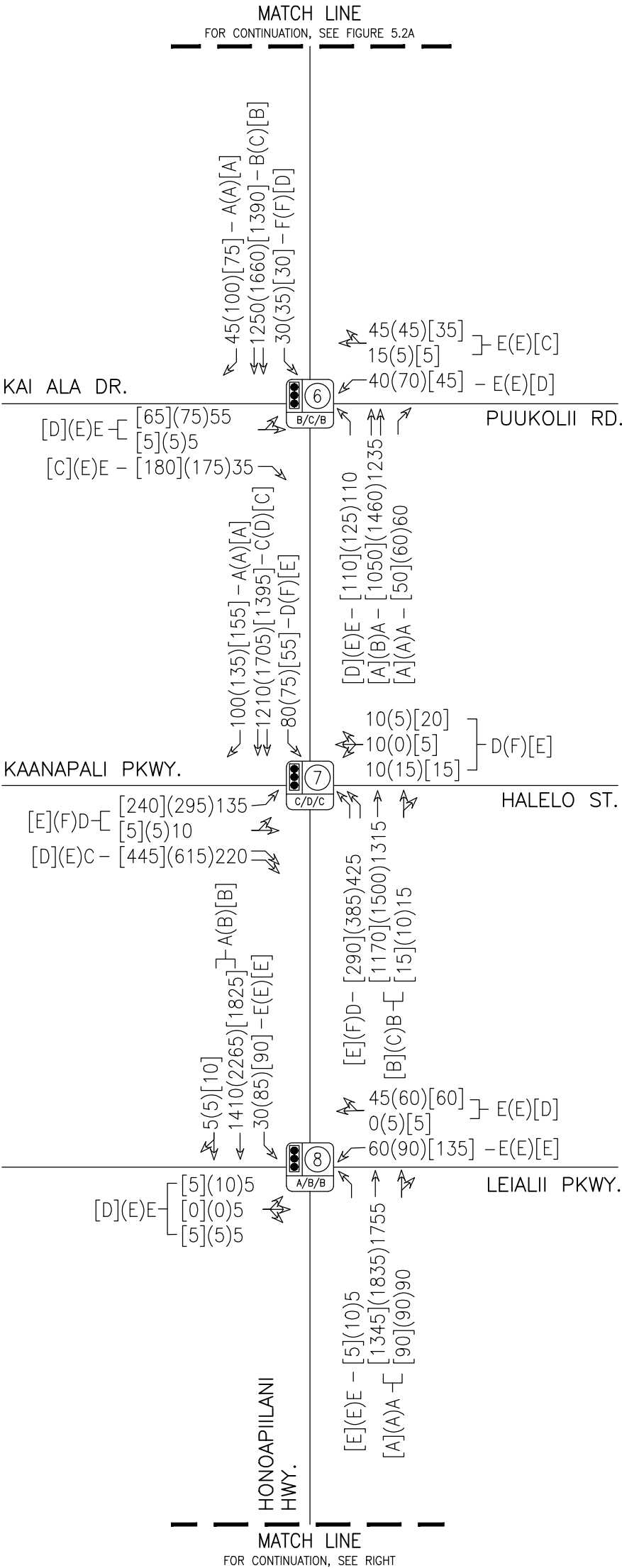




LEGEND

- AA(AA)[AA] - AM(PM)[WE] PEAK HOUR OF TRAFFIC VOLUMES
- X(X)[X] - AM(PM)[WE] LOS
- SIGNALIZED INTERSECTION Y, OVERALL AM/PM/WE LOS
- UNSIGNALIZED INTERSECTION X

**NOTE:**  
THIS DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY. DO NOT USE FOR CONSTRUCTION.





**Table 5.3: Future Year 2022 (Scenario 1)  
Left-Turn Storage Lane Length Calculations**

| Honoapiilani Highway & Akahele Street Intersection |           |                              |                    |                 |                        |                             |            |                                                            |
|----------------------------------------------------|-----------|------------------------------|--------------------|-----------------|------------------------|-----------------------------|------------|------------------------------------------------------------|
|                                                    |           |                              | AASHTO             |                 |                        |                             |            | Recommended storage length <sup>3</sup>                    |
| Movement                                           | Peak Hour | Design Volume per lane (veh) | Cycle Length (sec) | Cycles per Hour | Average Veh. per Cycle | Minimum                     |            |                                                            |
|                                                    |           |                              |                    |                 |                        | Storage Length (1.5 factor) |            |                                                            |
|                                                    |           |                              |                    |                 |                        | Veh                         | Ft         |                                                            |
| Northbound Left-turn lane                          | PM        | 165                          | 100                | 36              | 5                      | 7                           | <b>175</b> | Storage accommodated. Max queue could encroach into taper. |
|                                                    | WE        | 80                           | 100                | 36              | 3                      | 4                           | 100        |                                                            |
| Southbound Left-turn lane                          | PM        | 25                           | 100                | 36              | 1                      | 2                           | 60         | Storage accommodated                                       |
|                                                    | WE        | 25                           | 100                | 36              | 1                      | 2                           | <b>60</b>  |                                                            |
| Eastbound Left-turn lane                           | PM        | 60                           | 100                | 36              | 2                      | 3                           | <b>75</b>  | Storage accommodated                                       |
|                                                    | WE        | 40                           | 100                | 36              | 2                      | 2                           | 60         |                                                            |
| Westbound Left-turn lane                           | PM        | 30                           | 100                | 36              | 1                      | 2                           | 60         | Storage accommodated                                       |
|                                                    | WE        | 35                           | 100                | 36              | 1                      | 2                           | <b>60</b>  |                                                            |

Notes:

1. AM peak hour omitted, since PM and WE left-turns were highest volumes.
2. Minimum storage length is 1.5 times the average number of vehicles per cycle; assume 1 vehicle length = 25 ft.
3. Recommended storage length is exclusive of taper length or deceleration length. To be verified upon design.
4. Cycle Length based on existing observation. Majority of cycles < 100 seconds.
5. Observations: Existing NBLT majority average 1-3 car queue (75 ft storage) with a few occasional maximum 7 car queue (175 ft storage)

Table 5.4: Base Year 2022 with Mitigation and Future Year 2022 Scenario 1 Level of Service Summary

| Intersection                                                 | Base Year 2022 with Mitigation |           |     |           |           |     |           |           |     | Future Year 2022 Scenario 1 |           |     |           |           |     |           |           |     |
|--------------------------------------------------------------|--------------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|-----------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|
|                                                              | AM                             |           |     | PM        |           |     | WE        |           |     | AM                          |           |     | PM        |           |     | WE        |           |     |
|                                                              | HCM Delay                      | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay                   | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS |
| <b>1: Honoapiilani Highway &amp; Napilihau Street</b>        |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                        | 18.9                           | 0.75      | B   | 19.7      | 0.82      | B   | 19.5      | 0.77      | B   | 18.8                        | 0.75      | B   | 19.9      | 0.83      | B   | 19.6      | 0.78      | B   |
| NB TH                                                        | 8.1                            | 0.32      | A   | 6.0       | 0.23      | A   | 7.6       | 0.37      | A   | 8.1                         | 0.32      | A   | 5.9       | 0.23      | A   | 7.5       | 0.37      | A   |
| NB RT                                                        | 6.9                            | 0.08      | A   | 5.2       | 0.05      | A   | 5.9       | 0.03      | A   | 6.9                         | 0.08      | A   | 5.2       | 0.05      | A   | 5.8       | 0.03      | A   |
| EB LT/TH                                                     | 15.0                           | 0.26      | B   | 20.4      | 0.29      | C   | 17.8      | 0.28      | B   | 15.1                        | 0.26      | B   | 20.8      | 0.29      | C   | 18.1      | 0.28      | B   |
| EB RT                                                        | 14.5                           | 0.16      | B   | 19.5      | 0.13      | B   | 17.2      | 0.18      | B   | 14.6                        | 0.16      | B   | 19.8      | 0.13      | B   | 17.5      | 0.17      | B   |
| WB LT                                                        | 17.4                           | 0.30      | B   | 22.8      | 0.28      | C   | 19.5      | 0.18      | B   | 17.5                        | 0.30      | B   | 23.2      | 0.28      | C   | 19.9      | 0.19      | B   |
| WB TH/RT                                                     | 14.7                           | 0.22      | B   | 19.4      | 0.13      | B   | 17.7      | 0.27      | B   | 14.8                        | 0.22      | B   | 19.7      | 0.13      | B   | 18.0      | 0.27      | B   |
| SB LT                                                        | 66.8                           | 0.72      | E   | 73.0      | 0.73      | E   | 55.6      | 0.77      | E   | 67.0                        | 0.72      | E   | 73.4      | 0.73      | E   | 56.1      | 0.77      | E   |
| SB TH                                                        | 12.9                           | 0.31      | B   | 17.9      | 0.60      | B   | 15.2      | 0.57      | B   | 13.0                        | 0.32      | B   | 18.0      | 0.61      | B   | 15.3      | 0.57      | B   |
| SB RT                                                        | 11.2                           | 0.02      | B   | 13.1      | 0.05      | B   | 11.4      | 0.06      | B   | 11.3                        | 0.02      | B   | 13.2      | 0.05      | B   | 11.4      | 0.06      | B   |
| Overall                                                      | 14.2                           | -         | B   | 16.7      | -         | B   | 15.1      | -         | B   | 14.3                        | -         | B   | 16.8      | -         | B   | 15.2      | -         | B   |
| <b>2: Honoapiilani Highway &amp; Hoohui Road</b>             |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                        | 9.8                            | 0.36      | A   | 9.2       | 0.47      | A   | 8.4       | 0.33      | A   | 9.8                         | 0.37      | A   | 9.6       | 0.49      | A   | 8.4       | 0.33      | A   |
| NB TH                                                        | 10.8                           | 0.64      | B   | 9.3       | 0.66      | A   | 8.9       | 0.57      | A   | 11.0                        | 0.66      | B   | 9.3       | 0.66      | A   | 9.0       | 0.58      | A   |
| NB RT                                                        | 0.0                            | 0.00      | A   | 0.0       | 0.00      | A   | 0.0       | 0.00      | A   | 0.0                         | 0.00      | A   | 0.0       | 0.00      | A   | 0.0       | 0.00      | A   |
| EB LT/TH                                                     | 17.3                           | 0.17      | B   | 19.9      | 0.31      | B   | 16.3      | 0.22      | B   | 17.3                        | 0.17      | B   | 20.4      | 0.32      | C   | 16.5      | 0.22      | B   |
| EB RT                                                        | 16.3                           | 0.06      | B   | 18.4      | 0.07      | B   | 15.6      | 0.10      | B   | 16.3                        | 0.06      | B   | 18.9      | 0.07      | B   | 15.9      | 0.10      | B   |
| WB LT                                                        | 19.9                           | 0.28      | B   | 22.0      | 0.20      | C   | 17.7      | 0.14      | B   | 20.0                        | 0.28      | B   | 22.6      | 0.21      | C   | 17.9      | 0.14      | B   |
| WB TH/RT                                                     | 16.3                           | 0.07      | B   | 18.3      | 0.07      | B   | 15.5      | 0.06      | B   | 16.3                        | 0.07      | B   | 18.9      | 0.07      | B   | 15.7      | 0.06      | B   |
| SB LT                                                        | 9.7                            | 0.03      | A   | 8.1       | 0.07      | A   | 8.0       | 0.04      | A   | 9.8                         | 0.03      | A   | 8.1       | 0.07      | A   | 8.0       | 0.04      | A   |
| SB TH                                                        | 15.1                           | 0.77      | B   | 13.2      | 0.77      | B   | 12.5      | 0.73      | B   | 15.2                        | 0.77      | B   | 13.4      | 0.78      | B   | 12.5      | 0.74      | B   |
| SB RT                                                        | 9.5                            | 0.05      | A   | 8.0       | 0.06      | A   | 8.1       | 0.04      | A   | 9.5                         | 0.05      | A   | 8.0       | 0.06      | A   | 8.0       | 0.04      | A   |
| Overall                                                      | 13.3                           | -         | B   | 11.8      | -         | B   | 11.1      | -         | B   | 13.4                        | -         | B   | 12.0      | -         | B   | 11.2      | -         | B   |
| <b>3: Honoapiilani Highway &amp; Akalehe Street</b>          |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                        | 42.7                           | 0.77      | D   | 42.6      | 0.81      | D   | 37.1      | 0.76      | D   | 44.7                        | 0.77      | D   | 44.8      | 0.81      | D   | 39.3      | 0.76      | D   |
| NB TH                                                        | 10.6                           | 0.65      | B   | 13.0      | 0.76      | B   | 10.0      | 0.60      | A   | 12.1                        | 0.66      | B   | 15.4      | 0.78      | B   | 11.7      | 0.62      | B   |
| NB RT                                                        | 6.5                            | 0.01      | A   | 5.9       | 0.01      | A   | 6.4       | 0.01      | A   | 7.4                         | 0.02      | A   | 7.0       | 0.04      | A   | 7.6       | 0.03      | A   |
| EB LT                                                        | 44.0                           | 0.72      | D   | 52.9      | 0.77      | D   | 42.6      | 0.71      | D   | 47.7                        | 0.73      | D   | 54.8      | 0.77      | D   | 46.2      | 0.73      | D   |
| EB TH/RT                                                     | 24.0                           | 0.08      | C   | 32.8      | 0.04      | C   | 23.8      | 0.06      | C   | 25.6                        | 0.06      | C   | 34.6      | 0.09      | C   | 25.1      | 0.09      | C   |
| WB LT                                                        | 69.5                           | 0.53      | E   | 65.8      | 0.58      | E   | 51.3      | 0.55      | D   | 47.7                        | 0.73      | D   | 63.7      | 0.74      | E   | 45.7      | 0.70      | D   |
| WB TH                                                        | 25.3                           | 0.03      | C   | 35.5      | 0.03      | D   | 24.8      | 0.03      | C   | 25.7                        | 0.07      | C   | 36.3      | 0.09      | D   | 25.2      | 0.07      | C   |
| WB RT                                                        | 25.2                           | 0.01      | C   | 35.4      | 0.01      | D   | 24.7      | 0.01      | C   | 25.4                        | 0.01      | C   | 35.8      | 0.01      | D   | 24.9      | 0.01      | C   |
| SB LT                                                        | 112.0                          | 0.71      | F   | 126.5     | 0.72      | F   | 110.8     | 0.70      | F   | 78.6                        | 0.78      | E   | 80.5      | 0.82      | F   | 73.9      | 0.85      | E   |
| SB TH                                                        | 15.3                           | 0.84      | B   | 22.9      | 0.88      | C   | 15.5      | 0.83      | B   | 16.8                        | 0.85      | B   | 25.0      | 0.89      | C   | 17.1      | 0.84      | B   |
| SB RT                                                        | 7.8                            | 0.02      | A   | 10.6      | 0.05      | B   | 8.3       | 0.03      | A   | 8.6                         | 0.02      | A   | 11.2      | 0.05      | B   | 9.2       | 0.03      | A   |
| Overall                                                      | 15.7                           | -         | B   | 21.5      | -         | C   | 15.8      | -         | B   | 18.2                        | -         | B   | 24.5      | -         | C   | 18.6      | -         | B   |
| <b>4: Honoapiilani Highway &amp; Lower Honoapiilani Road</b> |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                        | 22.4                           | 0.83      | C   | 30.0      | 0.94      | C   | 21.2      | 0.87      | C   | 22.7                        | 0.83      | C   | 30.0      | 0.94      | C   | 21.6      | 0.87      | C   |
| NB TH/RT                                                     | 4.7                            | 0.33      | A   | 4.4       | 0.36      | A   | 2.4       | 0.24      | A   | 4.7                         | 0.34      | A   | 4.5       | 0.37      | A   | 2.5       | 0.25      | A   |
| EB LT/TH                                                     | 25.0                           | 0.19      | C   | 41.7      | 0.38      | D   | 26.8      | 0.28      | C   | 25.3                        | 0.20      | C   | 42.1      | 0.41      | D   | 27.3      | 0.31      | C   |
| EB RT                                                        | 0.0                            | 0.00      | A   | 0.0       | 0.00      | A   | 0.0       | 0.00      | A   | 0.0                         | 0.00      | A   | 0.0       | 0.00      | A   | 0.0       | 0.00      | A   |
| WB LT/TH/RT                                                  | 24.4                           | 0.10      | C   | 42.5      | 0.47      | D   | 25.3      | 0.05      | C   | 24.8                        | 0.11      | C   | 42.6      | 0.47      | D   | 25.6      | 0.05      | C   |
| SB LT                                                        | 50.7                           | 0.74      | D   | 87.3      | 0.72      | F   | 0.0       | 0.00      | A   | 51.1                        | 0.74      | D   | 87.4      | 0.72      | F   | 0.0       | 0.00      | A   |
| SB TH                                                        | 13.0                           | 0.58      | B   | 27.4      | 0.70      | C   | 14.7      | 0.58      | B   | 13.1                        | 0.59      | B   | 27.7      | 0.71      | C   | 15.0      | 0.59      | B   |
| SB RT                                                        | 9.2                            | 0.00      | A   | 19.5      | 0.01      | B   | 11.0      | 0.03      | B   | 9.2                         | 0.01      | A   | 19.5      | 0.01      | B   | 11.1      | 0.03      | B   |
| Overall                                                      | 12.0                           | -         | B   | 20.9      | -         | C   | 12.6      | -         | B   | 12.1                        | -         | B   | 20.9      | -         | C   | 12.7      | -         | B   |

Table 5.4: Base Year 2022 with Mitigation and Future Year 2022 Scenario 1 Level of Service Summary Cont'd

| Intersection                                                          | Base Year 2022 with Mitigation |           |     |           |           |     |           |           |     | Future Year 2022 Scenario 1 |           |     |           |           |     |           |           |     |
|-----------------------------------------------------------------------|--------------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|-----------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|
|                                                                       | AM                             |           |     | PM        |           |     | WE        |           |     | AM                          |           |     | PM        |           |     | WE        |           |     |
|                                                                       | HCM Delay                      | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay                   | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS |
| <b>5: Honoapiilani Highway &amp; Kai Malina Parkway/Halawai Drive</b> |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                 | 31.8                           | 0.79      | C   | 43.8      | 0.82      | D   | 35.3      | 0.78      | D   | 32.8                        | 0.79      | C   | 44.5      | 0.82      | D   | 36.0      | 0.78      | D   |
| NB TH/RT                                                              | 4.1                            | 0.45      | A   | 7.1       | 0.60      | A   | 4.9       | 0.41      | A   | 4.0                         | 0.45      | A   | 7.2       | 0.61      | A   | 5.0       | 0.42      | A   |
| EB LT/TH                                                              | 30.4                           | 0.16      | C   | 37.0      | 0.22      | D   | 30.2      | 0.25      | C   | 31.4                        | 0.17      | C   | 37.6      | 0.23      | D   | 30.9      | 0.27      | C   |
| EB RT                                                                 | 30.3                           | 0.01      | C   | 36.2      | 0.03      | D   | 29.5      | 0.04      | C   | 31.2                        | 0.01      | C   | 36.7      | 0.03      | D   | 30.1      | 0.05      | C   |
| WB LT/TH/RT                                                           | 30.9                           | 0.11      | C   | 38.1      | 0.08      | D   | 29.5      | 0.10      | C   | 31.8                        | 0.11      | C   | 38.7      | 0.08      | D   | 30.1      | 0.11      | C   |
| SB LT                                                                 | 53.5                           | 0.78      | D   | 73.1      | 0.78      | E   | 59.7      | 0.75      | E   | 54.8                        | 0.78      | D   | 73.9      | 0.78      | E   | 60.6      | 0.75      | E   |
| SB TH                                                                 | 7.7                            | 0.61      | A   | 12.5      | 0.72      | B   | 8.8       | 0.63      | A   | 7.8                         | 0.62      | A   | 12.7      | 0.73      | B   | 8.9       | 0.64      | A   |
| SB RT                                                                 | 4.5                            | 0.04      | A   | 6.4       | 0.04      | A   | 5.1       | 0.04      | A   | 4.5                         | 0.05      | A   | 6.4       | 0.04      | A   | 5.1       | 0.04      | A   |
| Overall                                                               | 8.1                            | -         | A   | 12.1      | -         | B   | 9.3       | -         | A   | 8.1                         | -         | A   | 12.2      | -         | B   | 9.4       | -         | A   |
| <b>6: Honoapiilani Highway &amp; Kai Ala Drive/Puukolii Road</b>      |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                 | 74.0                           | 0.85      | E   | 78.1      | 0.86      | E   | 39.8      | 0.78      | D   | 74.2                        | 0.85      | E   | 78.0      | 0.86      | E   | 40.2      | 0.78      | D   |
| NB TH                                                                 | 6.2                            | 0.48      | A   | 9.8       | 0.58      | A   | 8.2       | 0.49      | A   | 6.4                         | 0.48      | A   | 10.0      | 0.60      | B   | 8.3       | 0.50      | A   |
| NB RT                                                                 | 3.8                            | 0.04      | A   | 5.4       | 0.04      | A   | 5.5       | 0.03      | A   | 3.8                         | 0.04      | A   | 5.3       | 0.04      | A   | 5.5       | 0.03      | A   |
| EB LT/TH                                                              | 68.7                           | 0.38      | E   | 67.2      | 0.37      | E   | 31.3      | 0.23      | C   | 68.7                        | 0.38      | E   | 67.2      | 0.37      | E   | 31.8      | 0.25      | C   |
| EB RT                                                                 | 63.3                           | 0.01      | E   | 63.7      | 0.13      | E   | 30.1      | 0.05      | C   | 63.3                        | 0.01      | E   | 63.7      | 0.13      | E   | 30.3      | 0.05      | C   |
| WB LT                                                                 | 75.0                           | 0.39      | E   | 78.4      | 0.54      | E   | 34.6      | 0.21      | C   | 75.0                        | 0.39      | E   | 78.4      | 0.54      | E   | 35.3      | 0.22      | D   |
| WB TH/RT                                                              | 64.1                           | 0.10      | E   | 62.5      | 0.03      | E   | 29.9      | 0.03      | C   | 64.1                        | 0.10      | E   | 62.5      | 0.03      | E   | 30.2      | 0.03      | C   |
| SB LT                                                                 | 82.9                           | 0.69      | F   | 89.0      | 0.78      | F   | 42.4      | 0.58      | D   | 84.8                        | 0.76      | F   | 89.0      | 0.78      | F   | 42.8      | 0.58      | D   |
| SB TH                                                                 | 10.0                           | 0.52      | B   | 18.1      | 0.73      | B   | 13.6      | 0.73      | B   | 10.2                        | 0.53      | B   | 18.3      | 0.74      | B   | 13.7      | 0.73      | B   |
| SB RT                                                                 | 6.0                            | 0.03      | A   | 8.5       | 0.07      | A   | 7.4       | 0.05      | A   | 6.0                         | 0.03      | A   | 8.6       | 0.08      | A   | 7.4       | 0.05      | A   |
| Overall                                                               | 13.9                           | -         | B   | 19.9      | -         | B   | 13.6      | -         | B   | 14.1                        | -         | B   | 20.0      | -         | B   | 13.8      | -         | B   |
| <b>7: Honoapiilani Highway &amp; Kaanapali Parkway/Halelo Street</b>  |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                 | 40.7                           | 0.75      | D   | 91.4      | 0.85      | F   | 49.6      | 0.71      | D   | 41.7                        | 0.75      | D   | 92.7      | 0.85      | F   | 50.6      | 0.71      | D   |
| NB TH/RT                                                              | 16.2                           | 0.68      | B   | 22.0      | 0.66      | C   | 13.7      | 0.56      | B   | 16.0                        | 0.68      | B   | 22.4      | 0.67      | C   | 13.8      | 0.57      | B   |
| EB LT/TH                                                              | 44.2                           | 0.46      | D   | 86.1      | 0.60      | F   | 48.6      | 0.58      | D   | 45.4                        | 0.46      | D   | 87.8      | 0.61      | F   | 49.6      | 0.59      | D   |
| EB RT                                                                 | 28.3                           | 0.08      | C   | 63.9      | 0.51      | E   | 36.4      | 0.34      | D   | 29.1                        | 0.07      | C   | 64.9      | 0.51      | E   | 37.0      | 0.34      | D   |
| WB LT/TH/RT                                                           | 44.7                           | 0.18      | D   | 100.0     | 0.23      | F   | 54.7      | 0.32      | D   | 45.9                        | 0.18      | D   | 101.4     | 0.23      | F   | 55.7      | 0.32      | E   |
| SB LT                                                                 | 46.2                           | 0.57      | D   | 112.3     | 0.72      | F   | 53.9      | 0.50      | D   | 47.4                        | 0.57      | D   | 114.5     | 0.72      | F   | 55.0      | 0.51      | D   |
| SB TH                                                                 | 22.1                           | 0.75      | C   | 41.1      | 0.88      | D   | 20.8      | 0.76      | C   | 22.2                        | 0.75      | C   | 41.8      | 0.88      | D   | 21.0      | 0.76      | C   |
| SB RT                                                                 | 9.8                            | 0.08      | A   | 8.2       | 0.11      | A   | 6.9       | 0.13      | A   | 9.8                         | 0.09      | A   | 8.2       | 0.11      | A   | 6.8       | 0.12      | A   |
| Overall                                                               | 23.7                           | -         | C   | 44.8      | -         | D   | 24.1      | -         | C   | 23.8                        | -         | C   | 45.4      | -         | D   | 24.4      | -         | C   |
| <b>8: Honoapiilani Highway &amp; Leialii Parkway</b>                  |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                 | 75.8                           | 0.45      | E   | 69.1      | 0.50      | E   | 72.4      | 0.44      | E   | 75.8                        | 0.45      | E   | 74.2      | 0.50      | E   | 72.4      | 0.44      | E   |
| NB TH/RT                                                              | 8.8                            | 0.70      | A   | 2.4       | 0.75      | A   | 2.9       | 0.60      | A   | 8.8                         | 0.70      | A   | 2.4       | 0.75      | A   | 3.0       | 0.61      | A   |
| EB LT/TH/RT                                                           | 58.6                           | 0.06      | E   | 57.0      | 0.07      | E   | 50.0      | 0.03      | D   | 58.6                        | 0.06      | E   | 61.4      | 0.07      | E   | 50.0      | 0.03      | D   |
| WB LT                                                                 | 62.0                           | 0.37      | E   | 62.5      | 0.54      | E   | 58.1      | 0.63      | E   | 62.0                        | 0.37      | E   | 67.4      | 0.56      | E   | 58.1      | 0.63      | E   |
| WB TH/RT                                                              | 58.6                           | 0.01      | E   | 56.7      | 0.05      | E   | 50.3      | 0.05      | D   | 58.6                        | 0.01      | E   | 60.9      | 0.05      | E   | 50.3      | 0.05      | D   |
| SB LT                                                                 | 68.8                           | 0.52      | E   | 66.2      | 0.78      | E   | 76.2      | 0.79      | E   | 68.8                        | 0.52      | E   | 71.5      | 0.79      | E   | 76.2      | 0.79      | E   |
| SB TH/RT                                                              | 5.2                            | 0.51      | A   | 13.3      | 0.83      | B   | 10.2      | 0.70      | B   | 5.3                         | 0.52      | A   | 13.2      | 0.83      | B   | 10.3      | 0.71      | B   |
| Overall                                                               | 9.1                            | -         | A   | 10.8      | -         | B   | 11.0      | -         | B   | 9.1                         | -         | A   | 11.0      | -         | B   | 11.1      | -         | B   |

Table 5.4: Base Year 2022 with Mitigation and Future Year 2022 Scenario 1 Level of Service Summary Cont'd

| Intersection                                         | Base Year 2022 with Mitigation |           |     |           |           |     |           |           |     | Future Year 2022 Scenario 1 |           |     |           |           |     |           |           |     |
|------------------------------------------------------|--------------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|-----------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|
|                                                      | AM                             |           |     | PM        |           |     | WE        |           |     | AM                          |           |     | PM        |           |     | WE        |           |     |
|                                                      | HCM Delay                      | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay                   | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS |
| 9: Honoapiilani Highway & Front Street/Flemming Road |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                | 89.8                           | 0.73      | F   | 96.3      | 0.74      | F   | 87.9      | 0.84      | F   | 89.7                        | 0.73      | F   | 102.8     | 0.75      | F   | 87.3      | 0.84      | F   |
| NB TH/RT                                             | 7.6                            | 0.67      | A   | 1.9       | 0.71      | A   | 16.3      | 0.50      | B   | 7.7                         | 0.67      | A   | 2.2       | 0.71      | A   | 6.7       | 0.51      | A   |
| EB LT/TH/RT                                          | 52.6                           | 0.48      | D   | 59.5      | 0.72      | E   | 57.7      | 0.66      | E   | 52.6                        | 0.48      | D   | 65.1      | 0.74      | E   | 57.7      | 0.66      | E   |
| WB LT/TH/RT                                          | 54.3                           | 0.61      | D   | 49.7      | 0.24      | D   | 52.3      | 0.32      | D   | 54.3                        | 0.61      | D   | 53.0      | 0.24      | D   | 52.3      | 0.32      | D   |
| SB LT                                                | 88.2                           | 0.81      | F   | 87.4      | 0.74      | F   | 88.0      | 0.82      | F   | 88.0                        | 0.81      | F   | 93.6      | 0.75      | F   | 87.7      | 0.82      | F   |
| SB TH                                                | 4.9                            | 0.48      | A   | 11.8      | 0.79      | B   | 7.7       | 0.64      | A   | 5.0                         | 0.49      | A   | 12.5      | 0.79      | B   | 7.8       | 0.64      | A   |
| SB RT                                                | 3.2                            | 0.11      | A   | 5.6       | 0.24      | A   | 4.3       | 0.17      | A   | 3.2                         | 0.12      | A   | 5.9       | 0.23      | A   | 4.3       | 0.18      | A   |
| Overall                                              | 9.9                            | -         | A   | 10.4      | -         | B   | 14.8      | -         | B   | 9.9                         | -         | A   | 11.1      | -         | B   | 11.1      | -         | B   |
| 10: Honoapiilani Highway & Kapunakea Street          |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                | 74.7                           | 0.79      | E   | 67.6      | 0.79      | E   | 71.9      | 0.79      | E   | 74.6                        | 0.79      | E   | 87.9      | 0.82      | F   | 71.7      | 0.79      | E   |
| NB TH/RT                                             | 1.3                            | 0.66      | A   | 1.3       | 0.71      | A   | 2.8       | 0.58      | A   | 1.3                         | 0.66      | A   | 1.3       | 0.71      | A   | 2.9       | 0.59      | A   |
| EB LT/TH                                             | 64.2                           | 0.72      | E   | 62.3      | 0.75      | E   | 59.7      | 0.74      | E   | 64.2                        | 0.72      | E   | 68.9      | 0.77      | E   | 57.5      | 0.73      | E   |
| EB RT                                                | 48.3                           | 0.01      | D   | 43.6      | 0.03      | D   | 42.6      | 0.04      | D   | 48.3                        | 0.01      | D   | 47.1      | 0.03      | D   | 42.3      | 0.04      | D   |
| WB LT                                                | 55.1                           | 0.51      | E   | 46.9      | 0.29      | D   | 45.3      | 0.26      | D   | 55.1                        | 0.51      | E   | 50.6      | 0.30      | D   | 44.9      | 0.26      | D   |
| WB TH/RT                                             | 49.3                           | 0.10      | D   | 44.1      | 0.08      | D   | 42.9      | 0.07      | D   | 49.3                        | 0.10      | D   | 47.7      | 0.08      | D   | 42.7      | 0.07      | D   |
| SB LT                                                | 101.8                          | 0.83      | F   | 72.4      | 0.80      | E   | 85.2      | 0.84      | F   | 101.7                       | 0.83      | F   | 77.1      | 0.79      | E   | 85.5      | 0.84      | F   |
| SB TH/RT                                             | 10.3                           | 0.56      | B   | 5.5       | 0.89      | A   | 3.6       | 0.78      | A   | 10.5                        | 0.56      | B   | 5.1       | 0.88      | A   | 7.8       | 0.78      | A   |
| Overall                                              | 11.9                           | -         | B   | 9.7       | -         | A   | 9.7       | -         | A   | 11.9                        | -         | B   | 10.2      | -         | B   | 11.7      | -         | B   |
| 11: Honoapiilani Highway & Keawe Street              |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                | 79.8                           | 0.79      | E   | 69.3      | 0.78      | E   | 64.0      | 0.79      | E   | 79.8                        | 0.79      | E   | 79.7      | 0.78      | E   | 64.0      | 0.79      | E   |
| NB TH                                                | 32.3                           | 0.62      | C   | 39.4      | 0.75      | D   | 31.0      | 0.55      | C   | 32.5                        | 0.62      | C   | 40.5      | 0.74      | D   | 31.0      | 0.55      | C   |
| NB RT                                                | 23.6                           | 0.08      | C   | 28.6      | 0.21      | C   | 25.9      | 0.20      | C   | 23.7                        | 0.08      | C   | 29.7      | 0.22      | C   | 25.9      | 0.20      | C   |
| EB LT/TH                                             | 47.7                           | 0.35      | D   | 63.6      | 0.79      | E   | 61.5      | 0.77      | E   | 47.7                        | 0.35      | D   | 59.0      | 0.75      | E   | 61.6      | 0.77      | E   |
| EB RT                                                | 43.9                           | 0.02      | D   | 42.9      | 0.03      | D   | 44.5      | 0.04      | D   | 43.9                        | 0.02      | D   | 44.4      | 0.04      | D   | 44.4      | 0.04      | D   |
| WB LT                                                | 38.3                           | 0.29      | D   | 40.7      | 0.58      | D   | 42.2      | 0.62      | D   | 38.4                        | 0.29      | D   | 46.9      | 0.62      | D   | 42.2      | 0.62      | D   |
| WB TH                                                | 35.5                           | 0.14      | D   | 33.9      | 0.20      | C   | 34.6      | 0.25      | C   | 35.6                        | 0.14      | D   | 37.0      | 0.21      | D   | 34.6      | 0.25      | C   |
| WB RT                                                | 65.7                           | 0.92      | E   | 64.4      | 0.92      | E   | 43.2      | 0.68      | D   | 65.7                        | 0.92      | E   | 67.7      | 0.92      | E   | 43.7      | 0.70      | D   |
| SB LT                                                | 51.4                           | 0.91      | D   | 46.4      | 0.95      | D   | 62.2      | 0.88      | E   | 51.3                        | 0.91      | D   | 48.3      | 0.94      | D   | 58.0      | 0.89      | E   |
| SB TH/RT                                             | 1.0                            | 0.45      | A   | 1.3       | 0.70      | A   | 41.1      | 0.58      | D   | 1.0                         | 0.45      | A   | 1.3       | 0.69      | A   | 30.7      | 0.59      | C   |
| Overall                                              | 32.1                           | -         | C   | 32.2      | -         | C   | 43.9      | -         | D   | 32.0                        | -         | C   | 33.2      | -         | C   | 39.9      | -         | D   |
| 14: Road A & Akahele Street                          |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT/TH/RT                                          |                                |           |     |           |           |     |           |           |     | 9.4                         | 0.03      | A   | 9.8       | 0.03      | A   | 9.7       | 0.03      | A   |
| EB LT                                                |                                |           |     |           |           |     |           |           |     | 7.4                         | 0.00      | A   | 7.4       | 0.02      | A   | 7.4       | 0.01      | A   |
| WB LT                                                |                                |           |     |           |           |     |           |           |     | 7.3                         | 0.00      | A   | 7.4       | 0.00      | A   | 7.4       | 0.00      | A   |
| SB LT/TH/RT                                          |                                |           |     |           |           |     |           |           |     | 9.0                         | 0.04      | A   | 9.3       | 0.03      | A   | 9.2       | 0.03      | A   |
| Overall                                              |                                |           |     |           |           |     |           |           |     | 3.4                         | -         | -   | 3.2       | -         | -   | 3.0       | -         | -   |
| 15: Road C & Akahele Street                          |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT/TH/RT                                          |                                |           |     |           |           |     |           |           |     | 9.0                         | 0.01      | A   | 9.4       | 0.04      | A   | 9.4       | 0.04      | A   |
| EB LT/TH/RT                                          |                                |           |     |           |           |     |           |           |     | 7.3                         | 0.00      | A   | 7.3       | 0.01      | A   | 7.3       | 0.01      | A   |
| WB LT/TH/RT                                          |                                |           |     |           |           |     |           |           |     | 7.3                         | 0.00      | A   | 7.3       | 0.00      | A   | 7.3       | 0.00      | A   |
| SB LT/TH/RT                                          |                                |           |     |           |           |     |           |           |     | 8.8                         | 0.03      | A   | 9.0       | 0.02      | A   | 9.0       | 0.02      | A   |
| Overall                                              |                                |           |     |           |           |     |           |           |     | 4.2                         | -         | -   | 4.2       | -         | -   | 4.2       | -         | -   |



### 5.3 Future Year 2022 Scenario 2 Analysis

By completion of Scenario 2 in Future Year 2022, the Project is projected to generate a total of 210(332)[666] new external trips during the AM(PM)[WE] peak hours of traffic. Trips generated by the Project are expected to result in growth along major roadways in the study area. Traffic will access the site via Honoapiilani Highway at its intersections with Akahahele Street and the Project's proposed RIRO driveway for Retail Area North.

By Future Year 2022 WITH the cumulative increases of Project Scenarios 1 and 2, regional traffic at the study intersections (those not providing direct access to the Project) along Honoapiilani Highway is estimated to increase overall by approximately 5-15%, while local traffic at the study intersections (those providing direct access to the Project) along Honoapiilani Highway is estimated to increase overall by approximately 10-40% from Base Year 2022 without the Project scenario, during the AM, PM and WE peak hours of traffic.

#### 5.3.1 Future Year 2022 Scenario 2 Intersection Analysis

All study intersections are forecast to operate similar to Future Year 2022 Scenario 1 with the exception of the Honoapiilani Highway/Akahahele Street intersection described further below. The majority of intersection movements forecast to operate at LOS E/F for Future Year 2022 Scenario 1 conditions will continue to operate similarly with Future Year 2022 Scenario 2 of the Project. The majority of high volume through movements only experienced delay increases ranging from 1-5 seconds.

##### [3] Honoapiilani Highway/Akahahele Street

Since this intersection is the primary access from Honoapiilani Highway into the Project's Scenario 2 site, turning movements into and out of Akahahele Street will increase. As a result, the intersection will worsen, but operate adequately from an overall LOS B(C)[B] during the Future Year 2022 Scenario 1 condition to an overall LOS C(D)[C] for the Future Year 2022 Scenario 2. Various left-turn movements will operate at LOS E conditions during all peak hours, due to the long cycle length and increased turning movements at the intersection. However, all movements will continue to operate under capacity. It is recommended that the existing signal timing be optimized to accommodate turning movement increases.

Based on the AASHTO Green Book, left-turn storage lane lengths at the Honoapiilani Highway/Akahahele Street intersection were determined. See Table 5.5 for the recommended storage lane lengths. Based on the AASHTO Green Book, the following is recommended. Note, additional taper length and/or deceleration length to be provided/verified upon design:

- Northbound left-turn lane → Lengthen left-turn lane to provide at least 275 feet of storage space.
- Southbound left-turn lane → Lengthen left-turn lane to provide at least 275 feet of storage space.
- Westbound left-turn lane → Lengthen left-turn lane to provide at least 300 feet of storage space.

#### [12] Honoapiilani Highway/Retail Area North RIRO

The new RIRO access along Honoapiilani Highway, north of Akahahele Street, was analyzed as a stop-controlled intersection with stop control on the westbound right-turn movement out of Retail Area North. The westbound right-turn movement is expected to operate adequately with LOS C or better during all peak hours. It is recommended that a northbound right-turn deceleration lane be provided for entry into Retail Area North. Based on the AASHTO Green Book, the following is recommended:

- Northbound right-turn lane → Provide at least 100 feet of storage space. Additional taper length and/or deceleration length to be provided based upon design and constraints related to access location to nearby Honoapiilani Highway/Akahahele Street intersection. Based on AASHTO Green Book, 425 feet accommodates full deceleration length with a design speed of 50 mph.

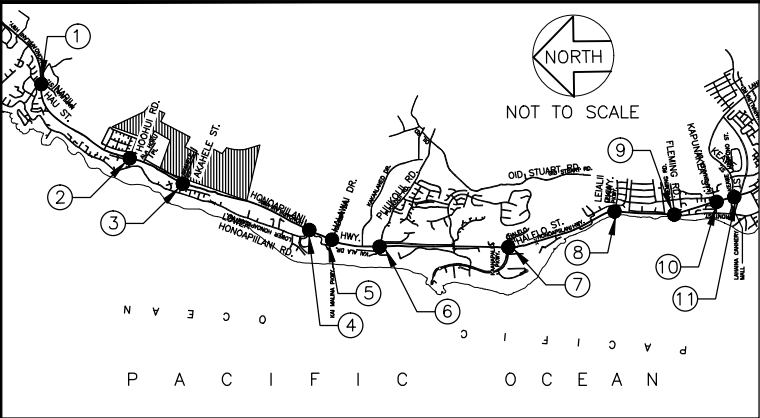
#### [14-15] Akahahele Street intersection with Road A and Road C

With the completion of Scenario 2, volumes along Akahahele Street are expected to increase. However, the roadway will continue to operate with low through volumes (under 25 vehicles) at the Road C intersection and slightly higher through volumes, between 50-150 vehicles, at the Road A intersection during all peak hours. The 50-150 vehicles traveling through the Road A intersection will still yield lengthy gaps in throughput traffic along Akahahele Street, eliminating occurrences of long queues for opposing left-turn movements turning from Akahahele Street. However, exclusive left-turn storage lanes should be considered to remove left-turns from the through lanes on Akahahele Street.

During the WE peak hour, the northbound shared left-turn/through/right-turn lane on Road A is expected to operate at LOS E due to the high left-turn volumes and the high volumes on Akahahele Street. However, as noted above, lengthy gaps are still expected along Akahahele Street as a result of the nearby Honoapiilani Highway/Akahahele Street signal.

Figure 5.3 illustrates the Project-generated trips for Future Year 2022 Scenario 2. Figure 5.4 illustrates the Future Year 2022 Scenario 2 forecast traffic volumes and LOS for the study intersection movements. Figure 5.5 illustrates the Future Year 2022 Scenario 2 forecast traffic volumes, LOS and intersection laneage along Akahahele Street and at the Project Retail Area North RIRO access. Table 5.6 summarizes the Future Year 2022 Scenario 2 LOS at the study intersections compared to Base Year 2022 with mitigation and Future Year 2022 Scenario 1 conditions. LOS worksheets are provided in Appendix C.

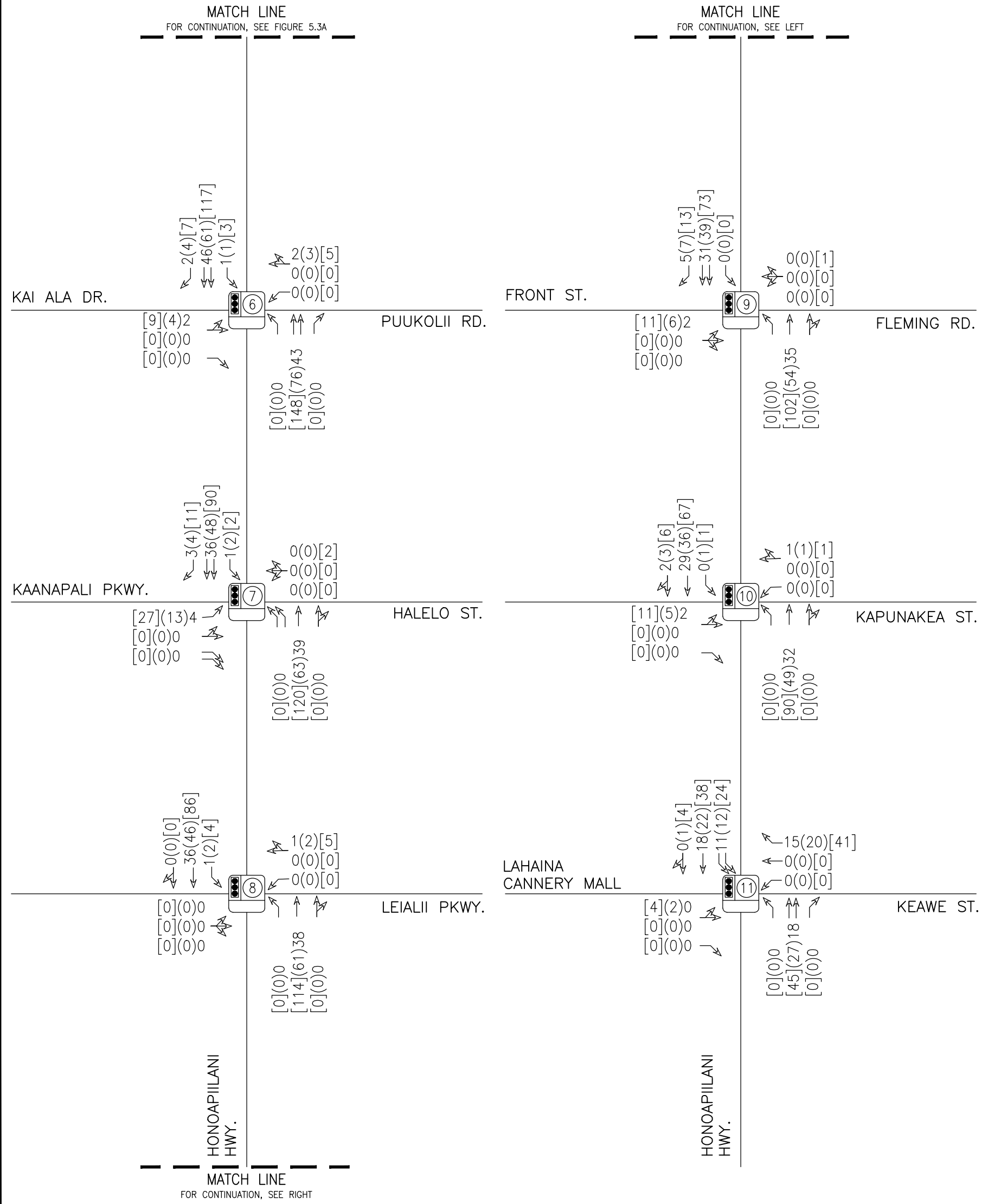




LEGEND

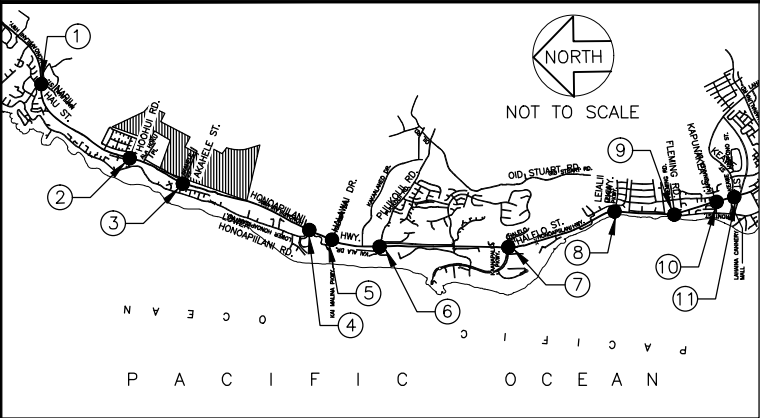
- AA(AA)[AA] - AM(PM)[WE] PEAK HOUR OF TRAFFIC VOLUMES
- [Signalized Intersection Symbol] - SIGNALIZED INTERSECTION Y
- (X) - UNSIGNALIZED INTERSECTION X

**NOTE:**  
THIS DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY. DO NOT USE FOR CONSTRUCTION.





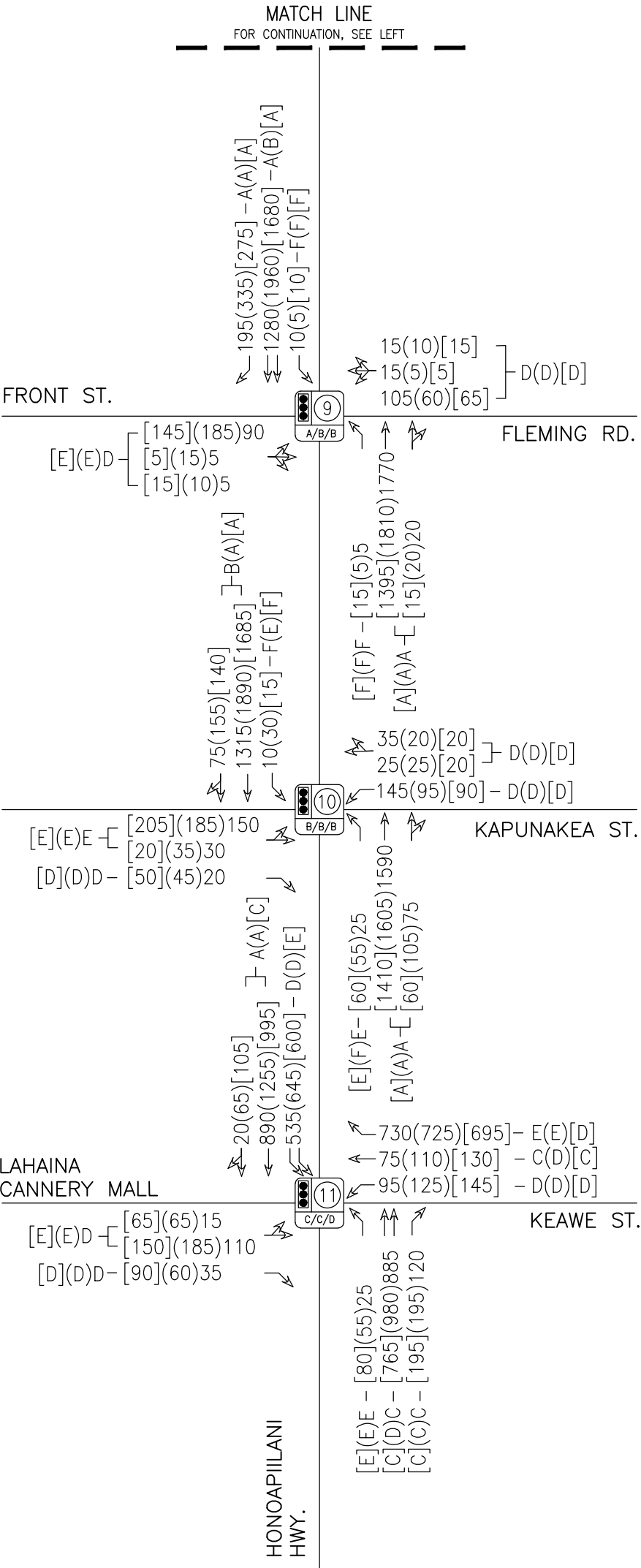
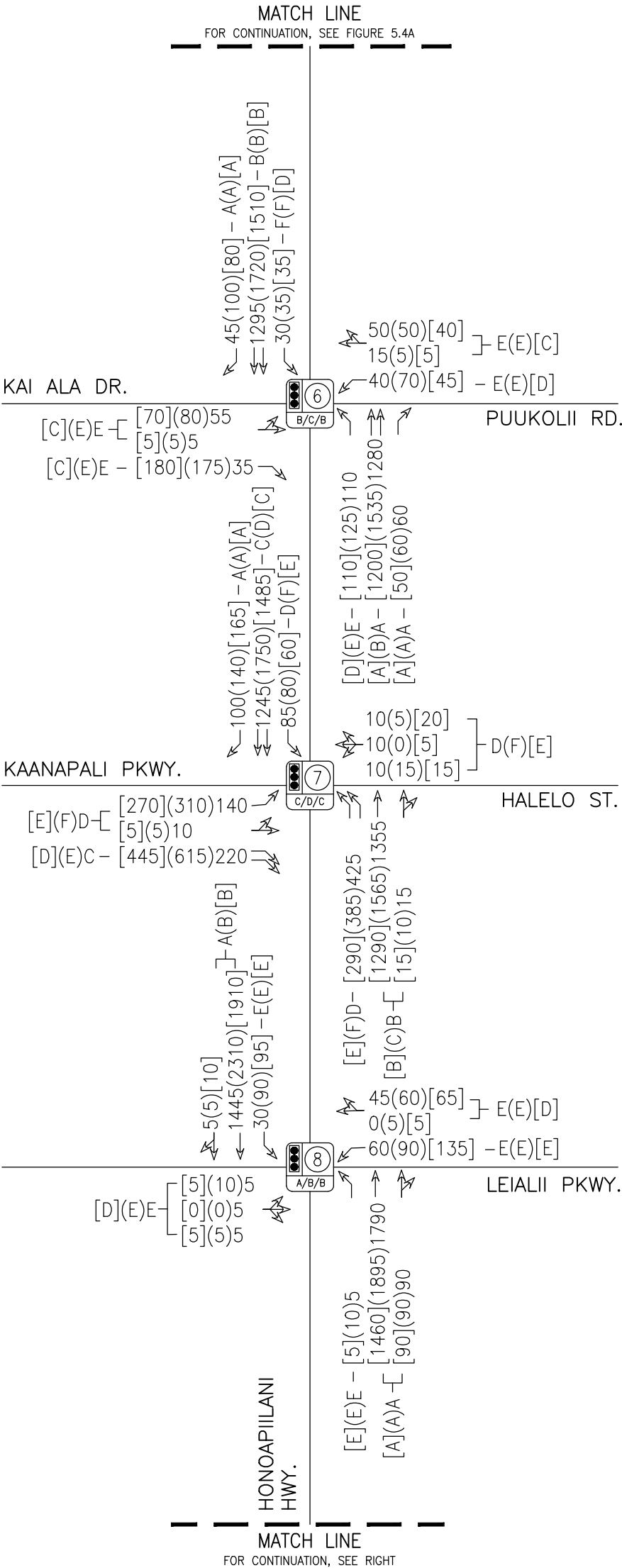




LEGEND

- AA(AA)[AA] - AM(PM)[WE] PEAK HOUR OF TRAFFIC VOLUMES
- X(X)[X] - AM(PM)[WE] LOS
- SIGNALIZED INTERSECTION Y, OVERALL AM/PM/WE LOS
- UNSIGNALIZED INTERSECTION X

**NOTE:**  
THIS DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY. DO NOT USE FOR CONSTRUCTION.



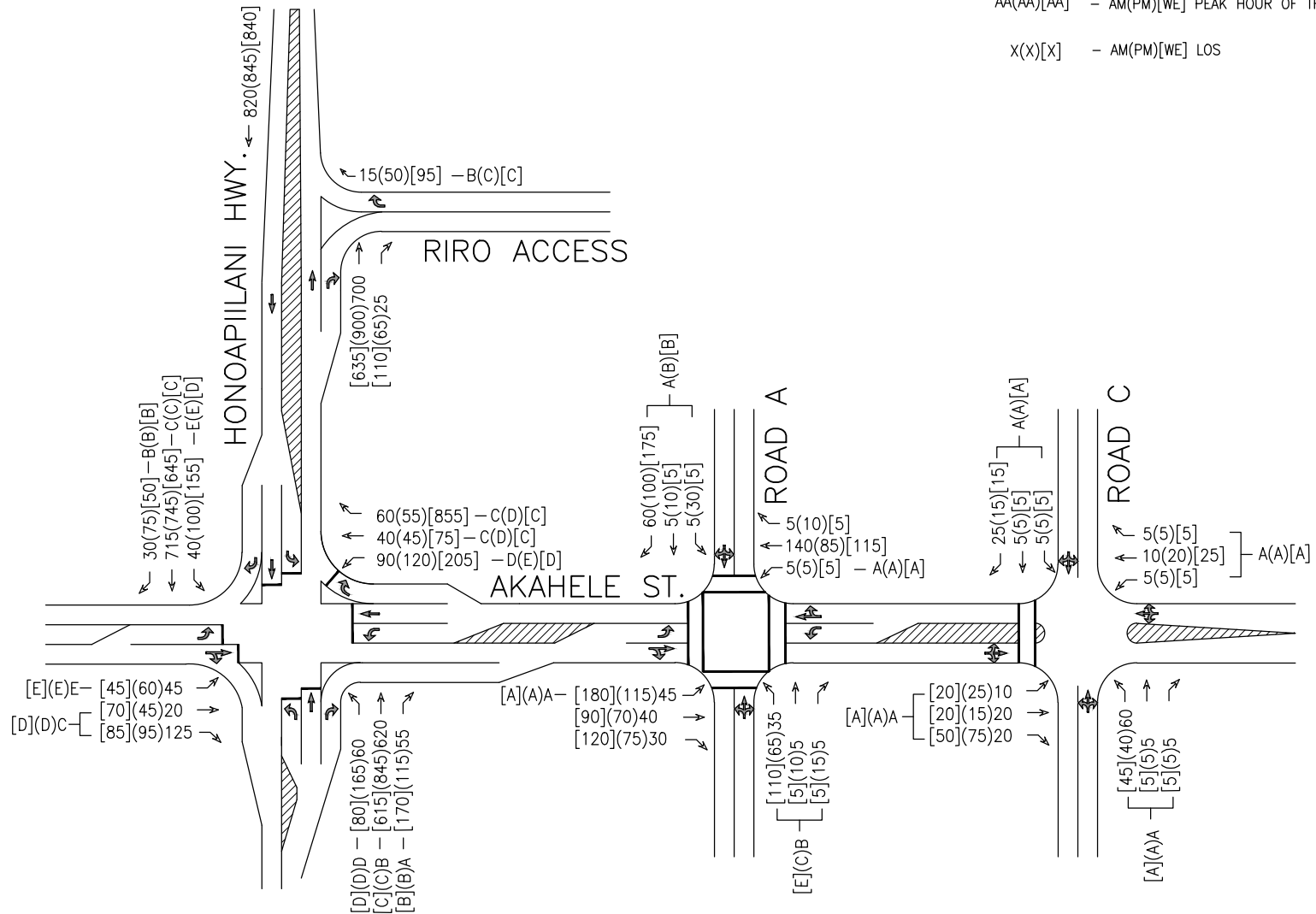


NOT TO SCALE

## LEGEND

AA(AA)[AA] - AM(PM)[WE] PEAK HOUR OF TRAFFIC VOLUMES

X(X)[X] - AM(PM)[WE] LOS



PULELEHUA



AUSTIN, TSUTSUMI & ASSOCIATES, INC.  
ENGINEERS, SURVEYORS  
HONOLULU, HAWAII

FIGURE

5.5

FUTURE YEAR 2022 SCENARIO 2  
AKAHELE STREET LANE CONFIGURATION, VOLUMES AND LOS

**Table 5.5: Future Year 2027 (Full Pulelehua build-out with School)  
Left-Turn Storage Lane Length Calculations**

| Honoapiilani Highway & Akahele Street Intersection |           |                              |                    |                 |                        |                             |     |               |                       |                                         |
|----------------------------------------------------|-----------|------------------------------|--------------------|-----------------|------------------------|-----------------------------|-----|---------------|-----------------------|-----------------------------------------|
|                                                    |           |                              | AASHTO             |                 |                        |                             |     | SIMULATION    |                       | Recommended storage length <sup>4</sup> |
| Movement                                           | Peak Hour | Design Volume per lane (veh) | Cycle Length (sec) | Cycles per Hour | Average Veh. per Cycle | Minimum                     |     | Average Queue | 95th Percentile Queue |                                         |
|                                                    |           |                              |                    |                 |                        | Storage Length (1.5 factor) |     |               |                       |                                         |
|                                                    |           |                              |                    |                 |                        | Veh                         | Ft  | Ft            | Ft                    |                                         |
| Northbound Left-turn lane                          | PM        | 170                          | 150                | 24              | 8                      | 11                          | 275 | 141           | 225                   | 275 ft                                  |
|                                                    | WE        | 85                           | 135                | 27              | 4                      | 5                           | 125 | 100           | 261                   |                                         |
| Southbound Left-turn lane                          | PM        | 135                          | 150                | 24              | 6                      | 9                           | 225 | 142           | 279                   | 275 ft                                  |
|                                                    | WE        | 165                          | 135                | 27              | 7                      | 10                          | 250 | 163           | 277                   |                                         |
| Eastbound Left-turn lane <sup>3</sup>              | PM        | 60                           | 150                | 24              | 3                      | 4                           | 100 | 57            | 120                   | Storage accommodated                    |
|                                                    | WE        | 45                           | 135                | 27              | 2                      | 3                           | 75  | 40            | 99                    |                                         |
| Westbound Left-turn lane                           | PM        | 145                          | 150                | 24              | 7                      | 10                          | 250 | 166           | 293                   | 300 ft                                  |
|                                                    | WE        | 215                          | 135                | 27              | 8                      | 12                          | 300 | 183           | 305                   |                                         |

Notes:

1. AM peak hour omitted, since PM and WE left-turns were highest volumes.
2. Minimum storage length is 1.5 times the average number of vehicles per cycle; assume 1 vehicle length = 25 ft.
3. Eastbound left-turn storage currently accommodated.
4. Recommended storage length is exclusive of taper length or deceleration length. To be verified upon design.

Table 5.6: Base Year 2022 with Mitigation, Future Year 2022 Scenario 1 and Future Year 2022 Scenario 2 Level of Service Summary

| Intersection                                                          | Base Year 2022 with Mitigation |           |     |           |           |     |           |           |     | Future Year 2022 Scenario 1 |           |     |           |           |     |           |           |     | Future Year 2022 Scenario 2 |           |     |           |           |     |           |           |     |
|-----------------------------------------------------------------------|--------------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|-----------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|-----------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|
|                                                                       | AM                             |           |     | PM        |           |     | WE        |           |     | AM                          |           |     | PM        |           |     | WE        |           |     | AM                          |           |     | PM        |           |     | WE        |           |     |
|                                                                       | HCM Delay                      | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay                   | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay                   | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS |
| <b>1: Honoapiilani Highway &amp; Napili Hau Street</b>                |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                 | 18.9                           | 0.75      | B   | 19.7      | 0.82      | B   | 19.5      | 0.77      | B   | 18.8                        | 0.75      | B   | 19.9      | 0.83      | B   | 19.6      | 0.78      | B   | 18.9                        | 0.75      | B   | 20.6      | 0.84      | C   | 20.6      | 0.80      | C   |
| NB TH                                                                 | 8.1                            | 0.32      | A   | 6.0       | 0.23      | A   | 7.6       | 0.37      | A   | 8.1                         | 0.32      | A   | 5.9       | 0.23      | A   | 7.5       | 0.37      | A   | 8.3                         | 0.34      | A   | 5.7       | 0.24      | A   | 7.2       | 0.39      | A   |
| NB RT                                                                 | 6.9                            | 0.08      | A   | 5.2       | 0.05      | A   | 5.9       | 0.03      | A   | 6.9                         | 0.08      | A   | 5.2       | 0.05      | A   | 5.8       | 0.03      | A   | 7.0                         | 0.08      | A   | 4.9       | 0.05      | A   | 5.4       | 0.03      | A   |
| EB LT/TH                                                              | 15.0                           | 0.26      | B   | 20.4      | 0.29      | C   | 17.8      | 0.28      | B   | 15.1                        | 0.26      | B   | 20.8      | 0.29      | C   | 18.1      | 0.28      | B   | 15.3                        | 0.25      | B   | 22.2      | 0.31      | C   | 20.2      | 0.31      | C   |
| EB RT                                                                 | 14.5                           | 0.16      | B   | 19.5      | 0.13      | B   | 17.2      | 0.18      | B   | 14.6                        | 0.16      | B   | 19.8      | 0.13      | B   | 17.5      | 0.17      | B   | 14.8                        | 0.16      | B   | 21.1      | 0.16      | C   | 19.4      | 0.18      | B   |
| WB LT                                                                 | 17.4                           | 0.30      | B   | 22.8      | 0.28      | C   | 19.5      | 0.18      | B   | 17.5                        | 0.30      | B   | 23.2      | 0.28      | C   | 19.9      | 0.19      | B   | 17.8                        | 0.31      | B   | 24.8      | 0.30      | C   | 22.3      | 0.21      | C   |
| WB TH/RT                                                              | 14.7                           | 0.22      | B   | 19.4      | 0.13      | B   | 17.7      | 0.27      | B   | 14.8                        | 0.22      | B   | 19.7      | 0.13      | B   | 18.0      | 0.27      | B   | 15.0                        | 0.21      | B   | 20.9      | 0.14      | C   | 19.9      | 0.29      | B   |
| SB LT                                                                 | 66.8                           | 0.72      | E   | 73.0      | 0.73      | E   | 55.6      | 0.77      | E   | 67.0                        | 0.72      | E   | 73.4      | 0.73      | E   | 56.1      | 0.77      | E   | 67.6                        | 0.72      | E   | 75.2      | 0.73      | E   | 59.3      | 0.78      | E   |
| SB TH                                                                 | 12.9                           | 0.31      | B   | 17.9      | 0.60      | B   | 15.2      | 0.57      | B   | 13.0                        | 0.32      | B   | 18.0      | 0.61      | B   | 15.3      | 0.57      | B   | 13.6                        | 0.33      | B   | 18.8      | 0.63      | B   | 16.4      | 0.60      | B   |
| SB RT                                                                 | 11.2                           | 0.02      | B   | 13.1      | 0.05      | B   | 11.4      | 0.06      | B   | 11.3                        | 0.02      | B   | 13.2      | 0.05      | B   | 11.4      | 0.06      | B   | 11.8                        | 0.02      | B   | 13.6      | 0.05      | B   | 11.9      | 0.06      | B   |
| Overall                                                               | 14.2                           | -         | B   | 16.7      | -         | B   | 15.1      | -         | B   | 14.3                        | -         | B   | 16.8      | -         | B   | 15.2      | -         | B   | 14.4                        | -         | B   | 17.5      | -         | B   | 16.0      | -         | B   |
| <b>2: Honoapiilani Highway &amp; Hoohui Road</b>                      |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                 | 9.8                            | 0.36      | A   | 9.2       | 0.47      | A   | 8.4       | 0.33      | A   | 9.8                         | 0.37      | A   | 9.6       | 0.49      | A   | 8.4       | 0.33      | A   | 10.3                        | 0.40      | B   | 10.8      | 0.55      | B   | 8.9       | 0.41      | A   |
| NB TH                                                                 | 10.8                           | 0.64      | B   | 9.3       | 0.66      | A   | 8.9       | 0.57      | A   | 11.0                        | 0.66      | B   | 9.3       | 0.66      | A   | 9.0       | 0.58      | A   | 11.3                        | 0.68      | B   | 9.5       | 0.68      | A   | 9.0       | 0.62      | A   |
| NB RT                                                                 | 0.0                            | 0.00      | A   | 0.0       | 0.00      | A   | 0.0       | 0.00      | A   | 0.0                         | 0.00      | A   | 0.0       | 0.00      | A   | 0.0       | 0.00      | A   | 0.0                         | 0.00      | A   | 0.0       | 0.00      | A   | 0.0       | 0.00      | A   |
| EB LT/TH                                                              | 17.3                           | 0.17      | B   | 19.9      | 0.31      | B   | 16.3      | 0.22      | B   | 17.3                        | 0.17      | B   | 20.4      | 0.32      | C   | 16.5      | 0.22      | B   | 17.9                        | 0.17      | B   | 21.7      | 0.32      | C   | 18.5      | 0.24      | B   |
| EB RT                                                                 | 16.3                           | 0.06      | B   | 18.4      | 0.07      | B   | 15.6      | 0.10      | B   | 16.3                        | 0.06      | B   | 18.9      | 0.07      | B   | 15.9      | 0.10      | B   | 16.9                        | 0.07      | B   | 20.1      | 0.07      | C   | 17.7      | 0.10      | B   |
| WB LT                                                                 | 19.9                           | 0.28      | B   | 22.0      | 0.20      | C   | 17.7      | 0.14      | B   | 20.0                        | 0.28      | B   | 22.6      | 0.21      | C   | 17.9      | 0.14      | B   | 20.8                        | 0.30      | C   | 24.2      | 0.23      | C   | 20.2      | 0.17      | C   |
| WB TH/RT                                                              | 16.3                           | 0.07      | B   | 18.3      | 0.07      | B   | 15.5      | 0.06      | B   | 16.3                        | 0.07      | B   | 18.9      | 0.07      | B   | 15.7      | 0.06      | B   | 16.9                        | 0.06      | B   | 20.1      | 0.07      | C   | 17.5      | 0.07      | B   |
| SB LT                                                                 | 9.7                            | 0.03      | A   | 8.1       | 0.07      | A   | 8.0       | 0.04      | A   | 9.8                         | 0.03      | A   | 8.1       | 0.07      | A   | 8.0       | 0.04      | A   | 10.0                        | 0.03      | B   | 8.3       | 0.07      | A   | 8.0       | 0.04      | A   |
| SB TH                                                                 | 15.1                           | 0.77      | B   | 13.2      | 0.77      | B   | 12.5      | 0.73      | B   | 15.2                        | 0.77      | B   | 13.4      | 0.78      | B   | 12.5      | 0.74      | B   | 15.6                        | 0.78      | B   | 14.1      | 0.80      | B   | 13.1      | 0.77      | B   |
| SB RT                                                                 | 9.5                            | 0.05      | A   | 8.0       | 0.06      | A   | 8.1       | 0.04      | A   | 9.5                         | 0.05      | A   | 8.0       | 0.06      | A   | 8.0       | 0.04      | A   | 9.6                         | 0.05      | A   | 8.0       | 0.07      | A   | 7.8       | 0.04      | A   |
| Overall                                                               | 13.3                           | -         | B   | 11.8      | -         | B   | 11.1      | -         | B   | 13.4                        | -         | B   | 12.0      | -         | B   | 11.2      | -         | B   | 13.8                        | -         | B   | 12.6      | -         | B   | 11.6      | -         | B   |
| <b>3: Honoapiilani Highway &amp; Akahale Street</b>                   |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                 | 42.7                           | 0.77      | D   | 42.6      | 0.81      | D   | 37.1      | 0.76      | D   | 44.7                        | 0.77      | D   | 44.8      | 0.81      | D   | 39.3      | 0.76      | D   | 48.9                        | 0.77      | D   | 54.1      | 0.84      | D   | 53.0      | 0.77      | D   |
| NB TH                                                                 | 10.6                           | 0.65      | B   | 13.0      | 0.76      | B   | 10.0      | 0.60      | A   | 12.1                        | 0.66      | B   | 15.4      | 0.78      | B   | 11.7      | 0.62      | B   | 16.0                        | 0.72      | B   | 34.5      | 0.93      | C   | 28.9      | 0.87      | C   |
| NB RT                                                                 | 6.5                            | 0.01      | A   | 5.9       | 0.01      | A   | 6.4       | 0.01      | A   | 7.4                         | 0.02      | A   | 7.0       | 0.04      | A   | 7.6       | 0.03      | A   | 9.7                         | 0.04      | A   | 12.3      | 0.09      | B   | 17.6      | 0.18      | B   |
| EB LT                                                                 | 44.0                           | 0.72      | D   | 52.9      | 0.77      | D   | 42.6      | 0.71      | D   | 47.7                        | 0.73      | D   | 54.8      | 0.77      | D   | 46.2      | 0.73      | D   | 55.2                        | 0.78      | E   | 63.3      | 0.77      | E   | 62.4      | 0.78      | E   |
| EB TH/RT                                                              | 24.0                           | 0.08      | C   | 32.8      | 0.04      | C   | 23.8      | 0.06      | C   | 25.6                        | 0.06      | C   | 34.6      | 0.09      | C   | 25.1      | 0.09      | C   | 29.1                        | 0.12      | C   | 46.8      | 0.52      | D   | 44.7      | 0.71      | D   |
| WB LT                                                                 | 69.5                           | 0.53      | E   | 65.8      | 0.58      | E   | 51.3      | 0.55      | D   | 47.7                        | 0.73      | D   | 63.7      | 0.74      | E   | 45.7      | 0.70      | D   | 43.5                        | 0.76      | D   | 56.4      | 0.81      | E   | 50.5      | 0.85      | D   |
| WB TH                                                                 | 25.3                           | 0.03      | C   | 35.5      | 0.03      | D   | 24.8      | 0.03      | C   | 25.7                        | 0.07      | C   | 36.3      | 0.09      | D   | 25.2      | 0.07      | C   | 26.8                        | 0.14      | C   | 39.3      | 0.17      | D   | 29.6      | 0.20      | C   |
| WB RT                                                                 | 25.2                           | 0.01      | C   | 35.4      | 0.01      | D   | 24.7      | 0.01      | C   | 25.4                        | 0.01      | C   | 35.8      | 0.01      | D   | 24.9      | 0.01      | C   | 26.2                        | 0.02      | C   | 38.2      | 0.03      | D   | 28.4      | 0.05      | C   |
| SB LT                                                                 | 112.0                          | 0.71      | F   | 126.5     | 0.72      | F   | 110.8     | 0.70      | F   | 78.6                        | 0.78      | E   | 80.5      | 0.82      | F   | 73.9      | 0.85      | E   | 58.6                        | 0.79      | E   | 57.5      | 0.79      | E   | 47.7      | 0.81      | D   |
| SB TH                                                                 | 15.3                           | 0.84      | B   | 22.9      | 0.88      | C   | 15.5      | 0.83      | B   | 16.8                        | 0.85      | B   | 25.0      | 0.89      | C   | 17.1      | 0.84      | B   | 20.1                        | 0.87      | C   | 31.8      | 0.89      | C   | 24.0      | 0.81      | C   |
| SB RT                                                                 | 7.8                            | 0.02      | A   | 10.6      | 0.05      | B   | 8.3       | 0.03      | A   | 8.6                         | 0.02      | A   | 11.2      | 0.05      | B   | 9.2       | 0.03      | A   | 10.3                        | 0.02      | B   | 14.1      | 0.05      | B   | 13.6      | 0.03      | B   |
| Overall                                                               | 15.7                           | -         | B   | 21.5      | -         | C   | 15.8      | -         | B   | 18.2                        | -         | B   | 24.5      | -         | C   | 18.6      | -         | B   | 22.8                        | -         | C   | 37.5      | -         | D   | 32.8      | -         | C   |
| <b>4: Honoapiilani Highway &amp; Lower Honoapiilani Road</b>          |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                 | 22.4                           | 0.83      | C   | 30.0      | 0.94      | C   | 21.2      | 0.87      | C   | 22.7                        | 0.83      | C   | 30.0      | 0.94      | C   | 21.6      | 0.87      | C   | 23.9                        | 0.84      | C   | 34.3      | 0.94      | C   | 26.1      | 0.89      | C   |
| NB TH/RT                                                              | 4.7                            | 0.33      | A   | 4.4       | 0.36      | A   | 2.4       | 0.24      | A   | 4.7                         | 0.34      | A   | 4.5       | 0.37      | A   | 2.5       | 0.25      | A   | 4.6                         | 0.35      | A   | 4.5       | 0.40      | A   | 2.8       | 0.31      | A   |
| EB LT/TH                                                              | 25.0                           | 0.19      | C   | 41.7      | 0.38      | D   | 26.8      | 0.28      | C   | 25.3                        | 0.20      | C   | 42.1      | 0.41      | D   | 27.3      | 0.31      | C   | 26.6                        | 0.20      | C   | 46.1      | 0.45      | D   | 32.2      | 0.38      | C   |
| EB RT                                                                 | 0.0                            | 0.00      | A   | 0.0       | 0.00      | A   | 0.0       | 0.00      | A   | 0.0                         | 0.00      | A   | 0.0       | 0.00      | A   | 0.0       | 0.00      | A   | 0.0                         | 0.00      | A   | 0.0       | 0.00      | A   | 0.0       | 0.00      | A   |
| WB LT/TH/RT                                                           | 24.4                           | 0.10      | C   | 42.5      | 0.47      | D   | 25.3      | 0.05      | C   | 24.8                        | 0.11      | C   | 42.6      | 0.47      | D   | 25.6      | 0.05      | C   | 26.1                        | 0.11      | C   | 46.3      | 0.48      | D   | 29.7      | 0.05      | C   |
| SB LT                                                                 | 50.7                           | 0.74      | D   | 87.3      | 0.72      | F   | 0.0       | 0.00      | A   | 51.1                        | 0.74      | D   | 87.4      | 0.72      | F   | 0.0       | 0.00      | A   | 52.8                        | 0.74      | D   | 91.8      | 0.73      | F   | 0.0       | 0.00      | A   |
| SB TH                                                                 | 13.0                           | 0.58      | B   | 27.4      | 0.70      | C   | 14.7      | 0.58      | B   | 13.1                        | 0.59      | B   | 27.7      | 0.71      | C   | 15.0      | 0.59      | B   | 13.3                        | 0.61      | B   | 29.3      | 0.74      | C   | 16.8      | 0.64      | B   |
| SB RT                                                                 | 9.2                            | 0.00      | A   | 19.5      | 0.01      | B   | 11.0      | 0.03      | B   | 9.2                         | 0.01      | A   | 19.5      | 0.01      | B   | 11.1      | 0.03      | B   | 9.2                         | 0.01      | A   | 20.0      | 0.01      | C   | 11.8      | 0.05      | B   |
| Overall                                                               | 12.0                           | -         | B   | 20.9      | -         | C   | 12.6      | -         | B   | 12.1                        | -         | B   | 20.9      | -         | C   | 12.7      | -         | B   | 12.3                        | -         | B   | 22.4      | -         | C   | 14.0      | -         | B   |
| <b>5: Honoapiilani Highway &amp; Kai Malina Parkway/Halawai Drive</b> |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                 | 31.8                           | 0.79      | C   | 43.8      | 0.82      | D   | 35.3      | 0.78      | D   | 32.8                        | 0.79      | C   | 44.5      | 0.82      | D   | 36.0      | 0.78      | D   | 34.2                        | 0.79      | C   | 46.6      | 0.82      | D   | 40.0      | 0.79      | D   |
| NB TH/RT                                                              | 4.1                            | 0.45      | A   | 7.1       | 0.60      | A   | 4.9       | 0.41      | A   | 4.0                         | 0.45      | A   | 7.2       | 0.61      | A   | 5.0       | 0.42      | A   | 4.1                         | 0.47      | A   | 7.7       | 0.64      | A   | 5.2       | 0.48      | A   |
| EB LT/TH                                                              | 30.4                           | 0.16      | C   | 37.0      | 0.22      | D   | 30.2      | 0.25      | C   | 31.4                        | 0.17      | C   | 37.6      | 0.23      | D   | 30.9      | 0.27      | C   | 32.8                        | 0.19      | C   | 39.4      | 0.25      | D   | 34.7      | 0.31      | C   |
| EB RT                                                                 | 30.3                           | 0.01      | C   | 36.2      | 0.03      | D   | 29.5      | 0.04      | C   | 31.2                        | 0.01      | C   | 36.7      | 0.03      | D   | 30.1      | 0.05      | C   | 32.5                        | 0.01      | C   | 38.4      | 0.03      | D   | 33.5      | 0.04      | C   |
| WB LT/TH/RT                                                           | 30.9                           | 0.11      | C   | 38.1      | 0.08      | D   | 29.5      | 0.10      | C   | 31.8                        |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |

Table 5.6: Base Year 2022 with Mitigation, Future Year 2022 Scenario 1 and Future Year 2022 Scenario 2 Level of Service Summary Cont'd

| Intersection                                                         | Base Year 2022 with Mitigation |           |     |           |           |     |           |           |     | Future Year 2022 Scenario 1 |           |     |           |           |     |           |           |     | Future Year 2022 Scenario 2 |           |     |           |           |     |           |           |     |
|----------------------------------------------------------------------|--------------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|-----------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|-----------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|
|                                                                      | AM                             |           |     | PM        |           |     | WE        |           |     | AM                          |           |     | PM        |           |     | WE        |           |     | AM                          |           |     | PM        |           |     | WE        |           |     |
|                                                                      | HCM Delay                      | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay                   | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay                   | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS |
| <b>6: Honoapiilani Highway &amp; Kai Ala Drive/Puukoli Road</b>      |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                | 74.0                           | 0.85      | E   | 78.1      | 0.86      | E   | 39.8      | 0.78      | D   | 74.2                        | 0.85      | E   | 78.0      | 0.86      | E   | 40.2      | 0.78      | D   | 74.1                        | 0.85      | E   | 77.8      | 0.86      | E   | 42.3      | 0.79      | D   |
| NB TH                                                                | 6.2                            | 0.48      | A   | 9.8       | 0.58      | A   | 8.2       | 0.49      | A   | 6.4                         | 0.48      | A   | 10.0      | 0.60      | B   | 8.3       | 0.50      | A   | 6.5                         | 0.50      | A   | 10.8      | 0.63      | B   | 8.8       | 0.56      | A   |
| NB RT                                                                | 3.8                            | 0.04      | A   | 5.4       | 0.04      | A   | 5.5       | 0.03      | A   | 3.8                         | 0.04      | A   | 5.3       | 0.04      | A   | 5.5       | 0.03      | A   | 3.8                         | 0.04      | A   | 5.5       | 0.04      | A   | 5.4       | 0.03      | A   |
| EB LT/TH                                                             | 68.7                           | 0.38      | E   | 67.2      | 0.37      | E   | 31.3      | 0.23      | C   | 68.7                        | 0.38      | E   | 67.2      | 0.37      | E   | 31.8      | 0.25      | C   | 68.7                        | 0.38      | E   | 67.1      | 0.39      | E   | 34.3      | 0.28      | C   |
| EB RT                                                                | 63.3                           | 0.01      | E   | 63.7      | 0.13      | E   | 30.1      | 0.05      | C   | 63.3                        | 0.01      | E   | 63.7      | 0.13      | E   | 30.3      | 0.05      | C   | 63.3                        | 0.01      | E   | 63.7      | 0.18      | E   | 32.5      | 0.05      | C   |
| WB LT                                                                | 75.0                           | 0.39      | E   | 78.4      | 0.54      | E   | 34.6      | 0.21      | C   | 75.0                        | 0.39      | E   | 78.4      | 0.54      | E   | 35.3      | 0.22      | D   | 75.0                        | 0.39      | E   | 78.7      | 0.54      | E   | 38.2      | 0.24      | D   |
| WB TH/RT                                                             | 64.1                           | 0.10      | E   | 62.5      | 0.03      | E   | 29.9      | 0.03      | C   | 64.1                        | 0.10      | E   | 62.5      | 0.03      | E   | 30.2      | 0.03      | C   | 64.1                        | 0.10      | E   | 62.1      | 0.03      | E   | 32.3      | 0.03      | C   |
| SB LT                                                                | 82.9                           | 0.69      | F   | 89.0      | 0.78      | F   | 42.4      | 0.58      | D   | 84.8                        | 0.76      | F   | 89.0      | 0.78      | F   | 42.8      | 0.58      | D   | 84.8                        | 0.76      | F   | 89.0      | 0.78      | F   | 45.3      | 0.62      | D   |
| SB TH                                                                | 10.0                           | 0.52      | B   | 18.1      | 0.73      | B   | 13.6      | 0.73      | B   | 10.2                        | 0.53      | B   | 18.3      | 0.74      | B   | 13.7      | 0.73      | B   | 10.5                        | 0.55      | B   | 19.7      | 0.77      | B   | 14.8      | 0.77      | B   |
| SB RT                                                                | 6.0                            | 0.03      | A   | 8.5       | 0.07      | A   | 7.4       | 0.05      | A   | 6.0                         | 0.03      | A   | 8.6       | 0.08      | A   | 7.4       | 0.05      | A   | 6.0                         | 0.03      | A   | 8.8       | 0.08      | A   | 7.2       | 0.05      | A   |
| Overall                                                              | 13.9                           | -         | B   | 19.9      | -         | B   | 13.6      | -         | B   | 14.1                        | -         | B   | 20.0      | -         | B   | 13.8      | -         | B   | 14.2                        | -         | B   | 20.9      | -         | C   | 14.5      | -         | B   |
| <b>7: Honoapiilani Highway &amp; Kaanapali Parkway/Halelo Street</b> |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                | 40.7                           | 0.75      | D   | 91.4      | 0.85      | F   | 49.6      | 0.71      | D   | 41.7                        | 0.75      | D   | 92.7      | 0.85      | F   | 50.6      | 0.71      | D   | 43.5                        | 0.76      | D   | 96.6      | 0.86      | F   | 57.8      | 0.74      | E   |
| NB TH/RT                                                             | 16.2                           | 0.68      | B   | 22.0      | 0.66      | C   | 13.7      | 0.56      | B   | 16.0                        | 0.68      | B   | 22.4      | 0.67      | C   | 13.8      | 0.57      | B   | 16.4                        | 0.69      | B   | 24.0      | 0.70      | C   | 15.1      | 0.61      | B   |
| EB LT/TH                                                             | 44.2                           | 0.46      | D   | 86.1      | 0.60      | F   | 48.6      | 0.58      | D   | 45.4                        | 0.46      | D   | 87.8      | 0.61      | F   | 49.6      | 0.59      | D   | 47.3                        | 0.48      | D   | 92.8      | 0.65      | F   | 56.3      | 0.65      | E   |
| EB RT                                                                | 28.3                           | 0.08      | C   | 63.9      | 0.51      | E   | 36.4      | 0.34      | D   | 29.1                        | 0.07      | C   | 64.9      | 0.51      | E   | 37.0      | 0.34      | D   | 30.4                        | 0.08      | C   | 68.0      | 0.52      | E   | 42.0      | 0.35      | D   |
| WB LT/TH/RT                                                          | 44.7                           | 0.18      | D   | 100.0     | 0.23      | F   | 54.7      | 0.32      | D   | 45.9                        | 0.18      | D   | 101.4     | 0.23      | F   | 55.7      | 0.32      | E   | 47.8                        | 0.18      | D   | 105.7     | 0.24      | F   | 63.6      | 0.35      | E   |
| SB LT                                                                | 46.2                           | 0.57      | D   | 112.3     | 0.72      | F   | 53.9      | 0.50      | D   | 47.4                        | 0.57      | D   | 114.5     | 0.72      | F   | 55.0      | 0.51      | D   | 49.3                        | 0.60      | D   | 123.6     | 0.74      | F   | 62.7      | 0.56      | E   |
| SB TH                                                                | 22.1                           | 0.75      | C   | 41.1      | 0.88      | D   | 20.8      | 0.76      | C   | 22.2                        | 0.75      | C   | 41.8      | 0.88      | D   | 21.0      | 0.76      | C   | 22.6                        | 0.76      | C   | 44.3      | 0.90      | D   | 22.7      | 0.78      | C   |
| SB RT                                                                | 9.8                            | 0.08      | A   | 8.2       | 0.11      | A   | 6.9       | 0.13      | A   | 9.8                         | 0.09      | A   | 8.2       | 0.11      | A   | 6.8       | 0.12      | A   | 9.7                         | 0.09      | A   | 8.2       | 0.11      | A   | 6.6       | 0.13      | A   |
| Overall                                                              | 23.7                           | -         | C   | 44.8      | -         | D   | 24.1      | -         | C   | 23.8                        | -         | C   | 45.4      | -         | D   | 24.4      | -         | C   | 24.5                        | -         | C   | 47.8      | -         | D   | 26.7      | -         | C   |
| <b>8: Honoapiilani Highway &amp; Leialii Parkway</b>                 |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                | 75.8                           | 0.45      | E   | 69.1      | 0.50      | E   | 72.4      | 0.44      | E   | 75.8                        | 0.45      | E   | 74.2      | 0.50      | E   | 72.4      | 0.44      | E   | 75.6                        | 0.45      | E   | 73.9      | 0.50      | E   | 71.9      | 0.44      | E   |
| NB TH/RT                                                             | 8.8                            | 0.70      | A   | 2.4       | 0.75      | A   | 2.9       | 0.60      | A   | 8.8                         | 0.70      | A   | 2.4       | 0.75      | A   | 3.0       | 0.61      | A   | 9.0                         | 0.71      | A   | 2.6       | 0.78      | A   | 3.4       | 0.66      | A   |
| EB LT/TH/RT                                                          | 58.6                           | 0.06      | E   | 57.0      | 0.07      | E   | 50.0      | 0.03      | D   | 58.6                        | 0.06      | E   | 61.4      | 0.07      | E   | 50.0      | 0.03      | D   | 58.6                        | 0.06      | E   | 61.4      | 0.07      | E   | 50.0      | 0.03      | D   |
| WB LT                                                                | 62.0                           | 0.37      | E   | 62.5      | 0.54      | E   | 58.1      | 0.63      | E   | 62.0                        | 0.37      | E   | 67.4      | 0.56      | E   | 58.1      | 0.63      | E   | 62.0                        | 0.37      | E   | 67.4      | 0.56      | E   | 58.1      | 0.63      | E   |
| WB TH/RT                                                             | 58.6                           | 0.01      | E   | 56.7      | 0.05      | E   | 50.3      | 0.05      | D   | 58.6                        | 0.01      | E   | 60.9      | 0.05      | E   | 50.3      | 0.05      | D   | 58.6                        | 0.01      | E   | 60.9      | 0.05      | E   | 50.3      | 0.05      | D   |
| SB LT                                                                | 68.8                           | 0.52      | E   | 66.2      | 0.78      | E   | 76.2      | 0.79      | E   | 68.8                        | 0.52      | E   | 71.5      | 0.79      | E   | 76.2      | 0.79      | E   | 68.8                        | 0.52      | E   | 74.5      | 0.80      | E   | 78.6      | 0.80      | E   |
| SB TH/RT                                                             | 5.2                            | 0.51      | A   | 13.3      | 0.83      | B   | 10.2      | 0.70      | B   | 5.3                         | 0.52      | A   | 13.2      | 0.83      | B   | 10.3      | 0.71      | B   | 5.5                         | 0.53      | A   | 14.1      | 0.85      | B   | 11.3      | 0.74      | B   |
| Overall                                                              | 9.1                            | -         | A   | 10.8      | -         | B   | 11.0      | -         | B   | 9.1                         | -         | A   | 11.0      | -         | B   | 11.1      | -         | B   | 9.3                         | -         | A   | 11.6      | -         | B   | 11.6      | -         | B   |
| <b>9: Honoapiilani Highway &amp; Front Street/Fleming Road</b>       |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                | 89.8                           | 0.73      | F   | 96.3      | 0.74      | F   | 87.9      | 0.84      | F   | 89.7                        | 0.73      | F   | 102.8     | 0.75      | F   | 87.3      | 0.84      | F   | 88.9                        | 0.73      | F   | 100.6     | 0.75      | F   | 85.9      | 0.84      | F   |
| NB TH/RT                                                             | 7.6                            | 0.67      | A   | 1.9       | 0.71      | A   | 16.3      | 0.50      | B   | 7.7                         | 0.67      | A   | 2.2       | 0.71      | A   | 6.7       | 0.51      | A   | 7.8                         | 0.68      | A   | 2.4       | 0.74      | A   | 7.6       | 0.55      | A   |
| EB LT/TH/RT                                                          | 52.6                           | 0.48      | D   | 59.5      | 0.72      | E   | 57.7      | 0.66      | E   | 52.6                        | 0.48      | D   | 65.1      | 0.74      | E   | 57.7      | 0.66      | E   | 52.6                        | 0.48      | D   | 65.2      | 0.75      | E   | 57.5      | 0.68      | E   |
| WB LT/TH/RT                                                          | 54.3                           | 0.61      | D   | 49.7      | 0.24      | D   | 52.3      | 0.32      | D   | 54.3                        | 0.61      | D   | 53.0      | 0.24      | D   | 52.3      | 0.32      | D   | 54.3                        | 0.61      | D   | 52.5      | 0.23      | D   | 51.3      | 0.30      | D   |
| SB LT                                                                | 88.2                           | 0.81      | F   | 87.4      | 0.74      | F   | 88.0      | 0.82      | F   | 88.0                        | 0.81      | F   | 93.6      | 0.75      | F   | 87.7      | 0.82      | F   | 87.7                        | 0.81      | F   | 92.2      | 0.75      | F   | 86.3      | 0.82      | F   |
| SB TH                                                                | 4.9                            | 0.48      | A   | 11.8      | 0.79      | B   | 7.7       | 0.64      | A   | 5.0                         | 0.49      | A   | 12.5      | 0.79      | B   | 7.8       | 0.64      | A   | 5.1                         | 0.50      | A   | 13.2      | 0.81      | B   | 8.7       | 0.68      | A   |
| SB RT                                                                | 3.2                            | 0.11      | A   | 5.6       | 0.24      | A   | 4.3       | 0.17      | A   | 3.2                         | 0.12      | A   | 5.9       | 0.23      | A   | 4.3       | 0.18      | A   | 3.2                         | 0.12      | A   | 6.1       | 0.24      | A   | 4.7       | 0.19      | A   |
| Overall                                                              | 9.9                            | -         | A   | 10.4      | -         | B   | 14.8      | -         | B   | 9.9                         | -         | A   | 11.1      | -         | B   | 11.1      | -         | B   | 10.0                        | -         | A   | 11.5      | -         | B   | 11.8      | -         | B   |
| <b>10: Honoapiilani Highway &amp; Kapunakea Street</b>               |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                | 74.7                           | 0.79      | E   | 67.6      | 0.79      | E   | 71.9      | 0.79      | E   | 74.6                        | 0.79      | E   | 87.9      | 0.82      | F   | 71.7      | 0.79      | E   | 74.0                        | 0.79      | E   | 83.9      | 0.82      | F   | 70.4      | 0.79      | E   |
| NB TH/RT                                                             | 1.3                            | 0.66      | A   | 1.3       | 0.71      | A   | 2.8       | 0.58      | A   | 1.3                         | 0.66      | A   | 1.3       | 0.71      | A   | 2.9       | 0.59      | A   | 1.3                         | 0.68      | A   | 1.2       | 0.74      | A   | 3.6       | 0.64      | A   |
| EB LT/TH                                                             | 64.2                           | 0.72      | E   | 62.3      | 0.75      | E   | 59.7      | 0.74      | E   | 64.2                        | 0.72      | E   | 68.9      | 0.77      | E   | 57.5      | 0.73      | E   | 64.5                        | 0.72      | E   | 69.3      | 0.77      | E   | 58.0      | 0.75      | E   |
| EB RT                                                                | 48.3                           | 0.01      | D   | 43.6      | 0.03      | D   | 42.6      | 0.04      | D   | 48.3                        | 0.01      | D   | 47.1      | 0.03      | D   | 42.3      | 0.04      | D   | 47.9                        | 0.01      | D   | 46.8      | 0.03      | D   | 41.2      | 0.04      | D   |
| WB LT                                                                | 55.1                           | 0.51      | E   | 46.9      | 0.29      | D   | 45.3      | 0.26      | D   | 55.1                        | 0.51      | E   | 50.6      | 0.30      | D   | 44.9      | 0.26      | D   | 54.6                        | 0.50      | D   | 50.2      | 0.29      | D   | 43.7      | 0.25      | D   |
| WB TH/RT                                                             | 49.3                           | 0.10      | D   | 44.1      | 0.08      | D   | 42.9      | 0.07      | D   | 49.3                        | 0.10      | D   | 47.7      | 0.08      | D   | 42.7      | 0.07      | D   | 48.9                        | 0.10      | D   | 47.3      | 0.08      | D   | 41.6      | 0.07      | D   |
| SB LT                                                                | 101.8                          | 0.83      | F   | 72.4      | 0.80      | E   | 85.2      | 0.84      | F   | 101.7                       | 0.83      | F   | 77.1      | 0.79      | E   | 85.5      | 0.84      | F   | 101.4                       | 0.83      | F   | 74.3      | 0.79      | E   | 84.3      | 0.84      | F   |
| SB TH/RT                                                             | 10.3                           | 0.56      | B   | 5.5       | 0.89      | A   | 3.6       | 0.78      | A   | 10.5                        | 0.56      | B   | 5.1       | 0.88      | A   | 7.8       | 0.78      | A   | 10.9                        | 0.58      | B   | 5.9       | 0.90      | A   | 9.9       | 0.83      | A   |
| Overall                                                              | 11.9                           | -         | B   | 9.7       | -         | A   | 9.7       | -         | A   | 11.9                        | -         | B   | 10.2      | -         | B   | 11.7      | -         | B   | 12.0                        | -         | B   | 10.5      | -         | B   | 12.9      | -         | B   |

Table 5.6: Base Year 2022 with Mitigation, Future Year 2022 Scenario 1 and Future Year 2022 Scenario 2 Level of Service Summary Cont'd

| Intersection                                       | Base Year 2022 with Mitigation |           |     |           |           |     |           |           |     | Future Year 2022 Scenario 1 |           |     |           |           |     |           |           |     | Future Year 2022 Scenario 2 |           |     |           |           |     |           |           |     |
|----------------------------------------------------|--------------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|-----------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|-----------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|
|                                                    | AM                             |           |     | PM        |           |     | WE        |           |     | AM                          |           |     | PM        |           |     | WE        |           |     | AM                          |           |     | PM        |           |     | WE        |           |     |
|                                                    | HCM Delay                      | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay                   | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay                   | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS |
| <b>11: Honoapiilani Highway &amp; Keawe Street</b> |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                              | 79.8                           | 0.79      | E   | 69.3      | 0.78      | E   | 64.0      | 0.79      | E   | 79.8                        | 0.79      | E   | 79.7      | 0.78      | E   | 64.0      | 0.79      | E   | 79.8                        | 0.79      | E   | 79.7      | 0.78      | E   | 64.0      | 0.79      | E   |
| NB TH                                              | 32.3                           | 0.62      | C   | 39.4      | 0.75      | D   | 31.0      | 0.55      | C   | 32.5                        | 0.62      | C   | 40.5      | 0.74      | D   | 31.0      | 0.55      | C   | 34.9                        | 0.66      | C   | 45.2      | 0.80      | D   | 33.5      | 0.61      | C   |
| NB RT                                              | 23.6                           | 0.08      | C   | 28.6      | 0.21      | C   | 25.9      | 0.20      | C   | 23.7                        | 0.08      | C   | 29.7      | 0.22      | C   | 25.9      | 0.20      | C   | 25.1                        | 0.08      | C   | 31.8      | 0.23      | C   | 27.2      | 0.21      | C   |
| EB LT/TH                                           | 47.7                           | 0.35      | D   | 63.6      | 0.79      | E   | 61.5      | 0.77      | E   | 47.7                        | 0.35      | D   | 59.0      | 0.75      | E   | 61.6      | 0.77      | E   | 46.2                        | 0.33      | D   | 57.2      | 0.73      | E   | 62.7      | 0.78      | E   |
| EB RT                                              | 43.9                           | 0.02      | D   | 42.9      | 0.03      | D   | 44.5      | 0.04      | D   | 43.9                        | 0.02      | D   | 44.4      | 0.04      | D   | 44.4      | 0.04      | D   | 42.5                        | 0.01      | D   | 42.5      | 0.03      | D   | 43.6      | 0.04      | D   |
| WB LT                                              | 38.3                           | 0.29      | D   | 40.7      | 0.58      | D   | 42.2      | 0.62      | D   | 38.4                        | 0.29      | D   | 46.9      | 0.62      | D   | 42.2      | 0.62      | D   | 37.1                        | 0.28      | D   | 43.8      | 0.59      | D   | 41.9      | 0.63      | D   |
| WB TH                                              | 35.5                           | 0.14      | D   | 33.9      | 0.20      | C   | 34.6      | 0.25      | C   | 35.6                        | 0.14      | D   | 37.0      | 0.21      | D   | 34.6      | 0.25      | C   | 34.4                        | 0.14      | C   | 35.2      | 0.20      | D   | 33.9      | 0.25      | C   |
| WB RT                                              | 65.7                           | 0.92      | E   | 64.4      | 0.92      | E   | 43.2      | 0.68      | D   | 65.7                        | 0.92      | E   | 67.7      | 0.92      | E   | 43.7      | 0.70      | D   | 66.5                        | 0.93      | E   | 69.0      | 0.93      | E   | 47.6      | 0.78      | D   |
| SB LT                                              | 51.4                           | 0.91      | D   | 46.4      | 0.95      | D   | 62.2      | 0.88      | E   | 51.3                        | 0.91      | D   | 48.3      | 0.94      | D   | 58.0      | 0.89      | E   | 51.2                        | 0.92      | D   | 47.4      | 0.95      | D   | 57.5      | 0.89      | E   |
| SB TH/RT                                           | 1.0                            | 0.45      | A   | 1.3       | 0.70      | A   | 41.1      | 0.58      | D   | 1.0                         | 0.45      | A   | 1.3       | 0.69      | A   | 30.7      | 0.59      | C   | 1.1                         | 0.47      | A   | 1.4       | 0.73      | A   | 31.9      | 0.62      | C   |
| Overall                                            | 32.1                           | -         | C   | 32.2      | -         | C   | 43.9      | -         | D   | 32.0                        | -         | C   | 33.2      | -         | C   | 39.9      | -         | D   | 32.8                        | -         | C   | 34.3      | -         | C   | 41.2      | -         | D   |
| <b>12: RIRO Access &amp; Honoapiilani Highway</b>  |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| WB RT                                              |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     | 14.3                        | 0.04      | B   | 19.4      | 0.18      | C   | 15.5      | 0.23      | C   |
| Overall                                            |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     | 0.1                         | -         | -   | 0.5       | -         | -   | 0.9       | -         | -   |
| <b>14: Road A &amp; Akahele Street</b>             |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT/TH/RT                                        |                                |           |     |           |           |     |           |           |     | 9.4                         | 0.03      | A   | 9.8       | 0.03      | A   | 9.7       | 0.03      | A   | 11.4                        | 0.08      | B   | 15.6      | 0.22      | C   | 35.5      | 0.54      | E   |
| EB LT                                              |                                |           |     |           |           |     |           |           |     | 7.4                         | 0.00      | A   | 7.4       | 0.02      | A   | 7.4       | 0.01      | A   | 7.5                         | 0.03      | A   | 7.6       | 0.08      | A   | 7.8       | 0.13      | A   |
| WB LT                                              |                                |           |     |           |           |     |           |           |     | 7.3                         | 0.00      | A   | 7.4       | 0.00      | A   | 7.4       | 0.00      | A   | 7.4                         | 0.00      | A   | 7.5       | 0.00      | A   | 7.7       | 0.00      | A   |
| SB LT/TH/RT                                        |                                |           |     |           |           |     |           |           |     | 9.0                         | 0.04      | A   | 9.3       | 0.03      | A   | 9.2       | 0.03      | A   | 9.5                         | 0.09      | A   | 11.1      | 0.21      | B   | 10.4      | 0.23      | B   |
| Overall                                            |                                |           |     |           |           |     |           |           |     | 3.4                         | -         | -   | 3.2       | -         | -   | 3.0       | -         | -   | 4.6                         | -         | -   | 6.9       | -         | -   | 9.7       | -         | -   |
| <b>15: Road C &amp; Akahele Street</b>             |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT/TH/RT                                        |                                |           |     |           |           |     |           |           |     | 9.0                         | 0.01      | A   | 9.4       | 0.04      | A   | 9.4       | 0.04      | A   | 9.0                         | 0.01      | A   | 9.9       | 0.07      | A   | 9.8       | 0.07      | A   |
| EB LT/TH/RT                                        |                                |           |     |           |           |     |           |           |     | 7.3                         | 0.00      | A   | 7.3       | 0.01      | A   | 7.3       | 0.01      | A   | 7.3                         | 0.01      | A   | 7.3       | 0.02      | A   | 7.3       | 0.01      | A   |
| WB LT/TH/RT                                        |                                |           |     |           |           |     |           |           |     | 7.3                         | 0.00      | A   | 7.3       | 0.00      | A   | 7.3       | 0.00      | A   | 7.3                         | 0.00      | A   | 7.4       | 0.00      | A   | 7.4       | 0.00      | A   |
| SB LT/TH/RT                                        |                                |           |     |           |           |     |           |           |     | 8.8                         | 0.03      | A   | 9.0       | 0.02      | A   | 9.0       | 0.02      | A   | 8.8                         | 0.04      | A   | 9.1       | 0.03      | A   | 9.1       | 0.03      | A   |
| Overall                                            |                                |           |     |           |           |     |           |           |     | 4.2                         | -         | -   | 4.2       | -         | -   | 4.2       | -         | -   | 4.4                         | -         | -   | 4.3       | -         | -   | 4.6       | -         | -   |

## 5.4 Future Year 2022 Scenario 3 Analysis

By completion of Scenario 3 in Future Year 2022, the Project is projected to generate an additional 168(255)[257] new external trips during the AM(PM)[WE] peak hours of traffic. Trips generated by the Project are expected to result in growth along major roadways in the study area. Traffic generated by Project Scenario 3 will access the site via a new Road J which is proposed to connect to Honoapiilani Highway and service the areas south of Mahinahina Gulch.

By Future Year 2022 WITH the cumulative increases of Project Scenarios 1, 2 and 3, regional traffic at the study intersections (those not providing direct access to the Project) along Honoapiilani Highway is estimated to increase overall by approximately 5-20%, while local traffic at the study intersections (those providing direct access to the Project) along Honoapiilani Highway is estimated to increase overall by approximately 10-50% from Base Year 2022 without the Project scenario, during the AM, PM and WE peak hours of traffic.

### 5.4.1 Future Year 2022 Scenario 3 Intersection Analysis

With the additional trips generated by Scenario 3, all study intersections are forecast to operate similar to Future Year 2022 with Scenario 2, with no major changes to LOS or capacity with the exception of the Honoapiilani Highway/Akahele Street intersection described further below. All intersection movements forecast to operate at LOS E/F for Future Year 2022 Scenario 2 conditions will continue to operate at LOS E/F conditions during Future Year 2022 Scenario 3. The majority of high volume through movements only experienced delay increases ranging from 1-5 seconds.

#### [3] Honoapiilani Highway/Akahele Street

Due to the continued development of areas north of Mahinahina Gulch, turning movements into and out of Akahele Street will increase. As a result, the intersection will worsen, but operate adequately from an overall LOS C(D)[C] during the Future Year 2022 Scenario 2 condition to an overall LOS C(D)[D] for the Future Year 2022 Scenario 3. The majority of left-turn movements will operate at LOS E conditions during all peak hours, due to the long cycle length and increased turning movements at the intersection. However, all movements will continue to operate under capacity. All left-turn storage lane lengths recommended in Table 5.5 accounts for traffic generated for the Future Year 2022 Scenario 3.

#### [13] Honoapiilani Highway/Road J

The proposed Honoapiilani Highway/Road J intersection was analyzed as an unsignalized intersection, which includes exclusive westbound left-turn and right-turn lanes, an exclusive southbound left-turn lane and an exclusive northbound right-turn lane. A southbound median refuge lane along Honoapiilani Highway is also recommended to facilitate westbound vehicles making the left-turn movement from Road J onto Honoapiilani Highway. Based on the Manual on Uniform Traffic Control Devices (MUTCD), Federal Highway Administration, dated 2009, Four-Hour Vehicular Volume traffic signal warrant, a traffic signal is not forecast to be warranted. Signal warrant figures are shown in Appendix D. Based on the AASHTO Green Book, the following is recommended:

- Northbound Approach → Provide one (1) through lane and a new right-turn deceleration lane with at least 100 feet of storage space. Additional taper length and/or deceleration length to be provided based upon design. AASHTO Green Book recommends 425 feet to accommodate full deceleration length with a design speed of 50 mph.



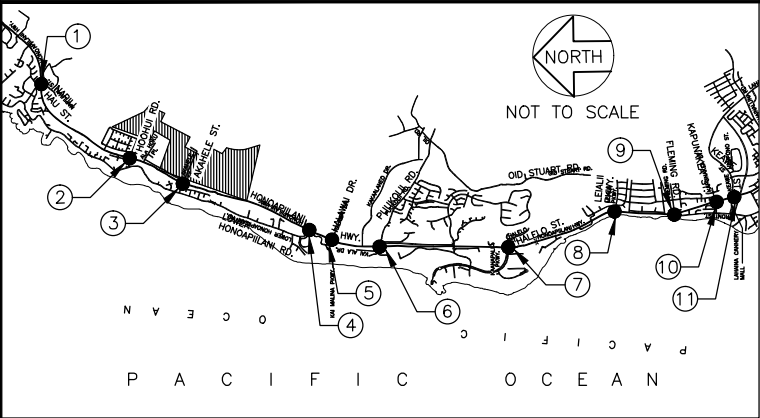


- Southbound Approach → Provide one (1) through lane and a new left-turn storage lane with at least 100 feet of storage space. Additional taper length and/or deceleration length to be provided based upon design. AASHTO Green Book recommends 425 feet to accommodate full deceleration length with a design speed of 50 mph.
  - o Construct a median refuge lane to facilitate westbound left-turn traffic exiting Road J going onto Honoapiilani Highway.
- Westbound Approach → Provide a new left-turn storage lane and a new 100 feet right-turn storage lane.

Based on the above configuration, the westbound left-turn out of the Project is expected to operate at LOS F during the PM peak hour of traffic and LOS E during the WE peak hour of traffic. However, gaps in through traffic along Honoapiilani Highway will help facilitate westbound left-turn movements due to traffic being controlled by the upstream signal at Akahele Street to the north and downstream signal at Lower Honoapiilani Road to the south. Also, a median refuge lane is proposed to provide two-stage movement for left-turn vehicles to cross one direction at a time.

Figure 5.6 illustrates the Project-generated trips for Future Year 2022 Scenario 3. Figure 5.7 illustrates the Future Year 2022 Scenario 3 forecast traffic volumes and LOS for the study intersection movements. Table 5.7 summarizes the Future Year 2022 Scenario 3 LOS at the study intersections compared to Base Year 2022 with mitigation and Future Year 2022 Scenario 2. LOS worksheets are provided in Appendix C.

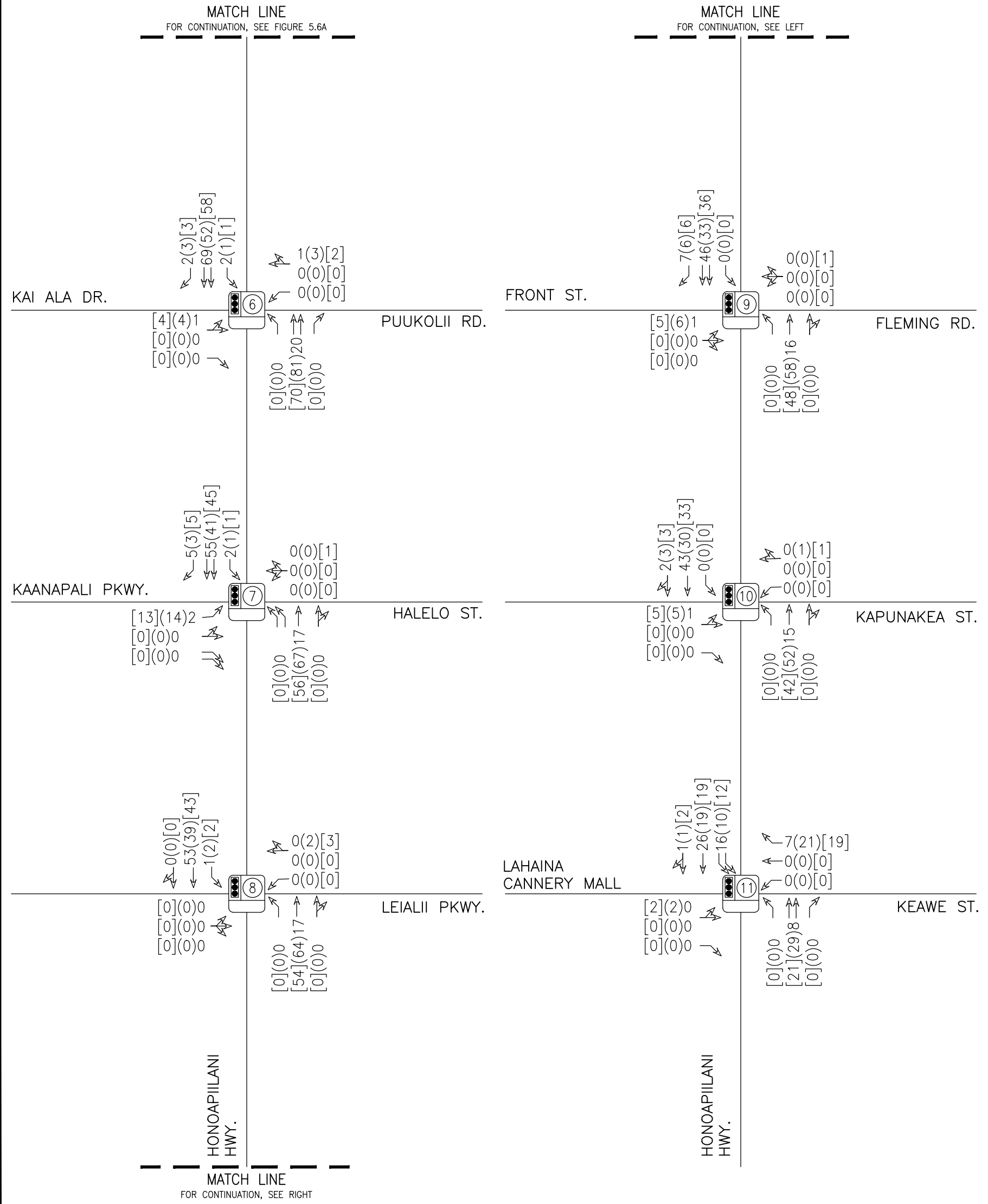




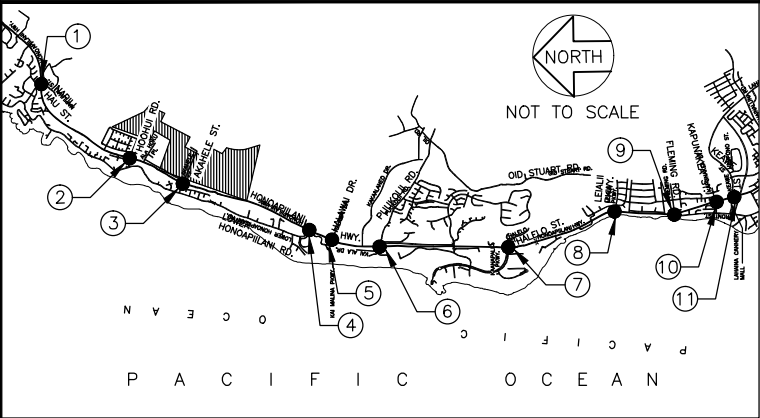
LEGEND

- AA(AA)[AA] - AM(PM)[WE] PEAK HOUR OF TRAFFIC VOLUMES
- SIGNALIZED INTERSECTION Y
- UNSIGNALIZED INTERSECTION X

**NOTE:**  
THIS DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY. DO NOT USE FOR CONSTRUCTION.



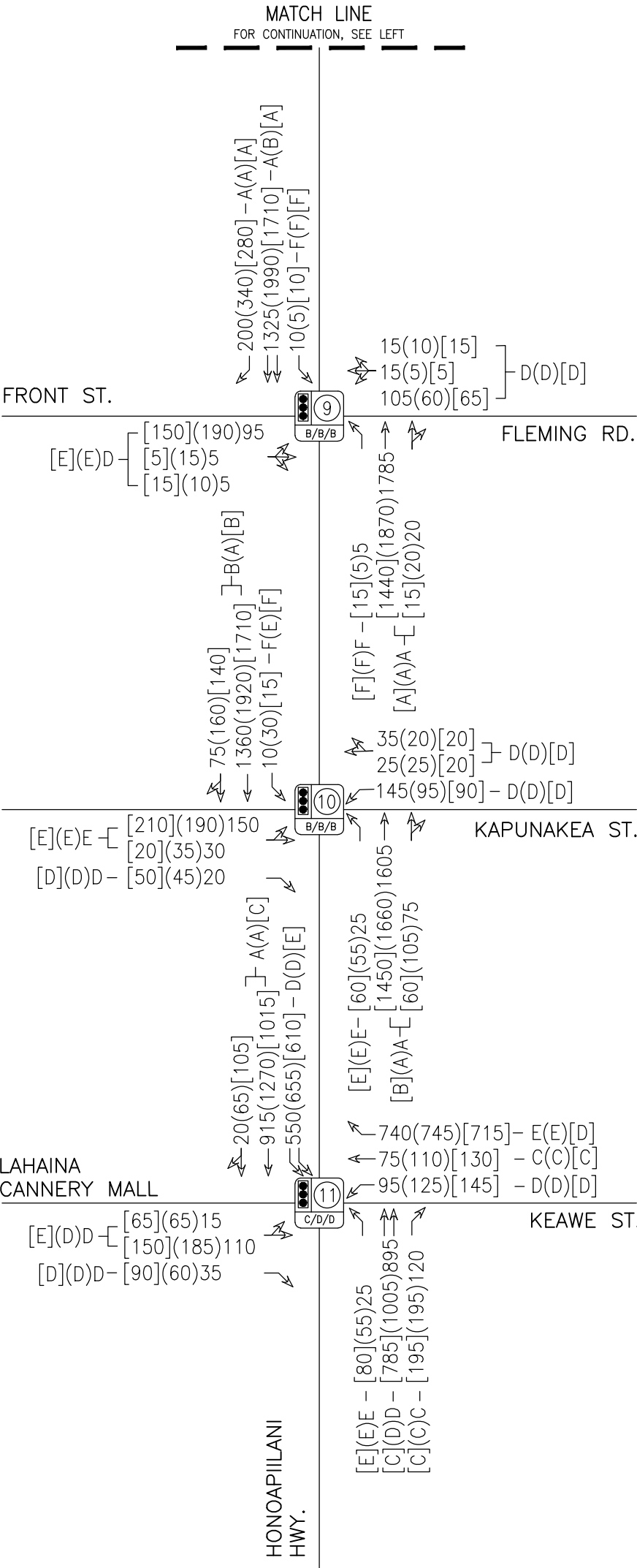
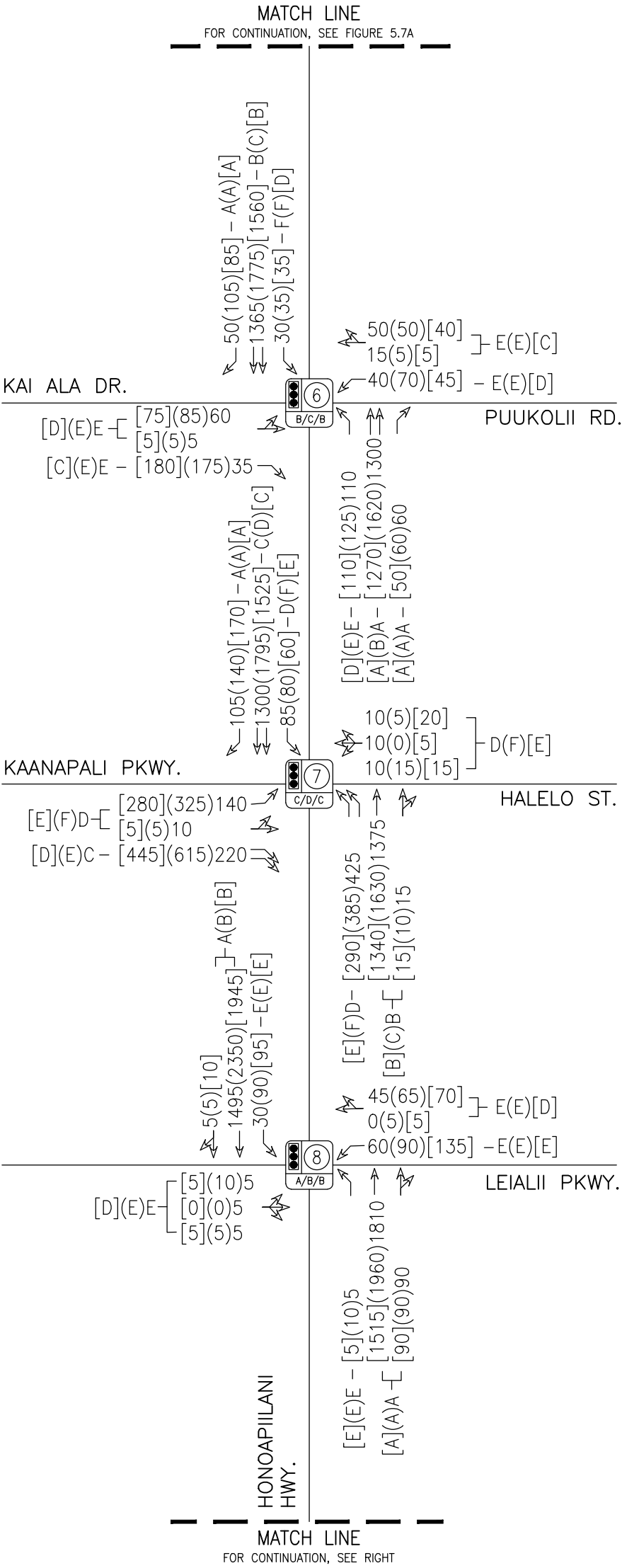




LEGEND

- AA(AA)[AA] - AM(PM)[WE] PEAK HOUR OF TRAFFIC VOLUMES
- X(X)[X] - AM(PM)[WE] LOS
-  - SIGNALIZED INTERSECTION Y, OVERALL AM/PM/WE LOS
-  - UNSIGNALIZED INTERSECTION X

**NOTE:**  
THIS DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY. DO NOT USE FOR CONSTRUCTION.



PULELEHUA



AUSTIN, TSUTSUMI & ASSOCIATES, INC.

ENGINEERS,SURVEYORS

HONOLULU,HAWAII

FUTURE YEAR 2022 SCENARIO 3 LANE CONFIGURATION,  
VOLUMES AND LOS

FIGURE  
5.7B

Table 5.7: Base Year 2022 with Mitigation, Future Year 2022 Scenario 2 and Future Year 2022 Scenario 3 Level of Service Summary

| Intersection                                                 | Base Year 2022 with Mitigation |           |     |           |           |     |           |           |     | Future Year 2022 Scenario 2 |           |     |           |           |     |           |           |     | Future Year 2022 Scenario 3 |           |     |           |           |     |           |           |     |  |
|--------------------------------------------------------------|--------------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|-----------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|-----------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|--|
|                                                              | AM                             |           |     | PM        |           |     | WE        |           |     | AM                          |           |     | PM        |           |     | WE        |           |     | AM                          |           |     | PM        |           |     | WE        |           |     |  |
|                                                              | HCM Delay                      | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay                   | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay                   | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS |  |
| <b>1: Honoapiilani Highway &amp; Napilihau Street</b>        |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |  |
| NB LT                                                        | 18.9                           | 0.75      | B   | 19.7      | 0.82      | B   | 19.5      | 0.77      | B   | 18.9                        | 0.75      | B   | 20.6      | 0.84      | C   | 20.6      | 0.80      | C   | 18.9                        | 0.76      | B   | 21.5      | 0.85      | C   | 21.2      | 0.81      | C   |  |
| NB TH                                                        | 8.1                            | 0.32      | A   | 6.0       | 0.23      | A   | 7.6       | 0.37      | A   | 8.3                         | 0.34      | A   | 5.7       | 0.24      | A   | 7.2       | 0.39      | A   | 8.3                         | 0.35      | A   | 5.7       | 0.24      | A   | 7.3       | 0.40      | A   |  |
| NB RT                                                        | 6.9                            | 0.08      | A   | 5.2       | 0.05      | A   | 5.9       | 0.03      | A   | 7.0                         | 0.08      | A   | 4.9       | 0.05      | A   | 5.4       | 0.03      | A   | 7.0                         | 0.09      | A   | 4.9       | 0.05      | A   | 5.4       | 0.03      | A   |  |
| EB LT/TH                                                     | 15.0                           | 0.26      | B   | 20.4      | 0.29      | C   | 17.8      | 0.28      | B   | 15.3                        | 0.25      | B   | 22.2      | 0.31      | C   | 20.2      | 0.31      | C   | 15.5                        | 0.25      | B   | 22.9      | 0.30      | C   | 20.7      | 0.31      | C   |  |
| EB RT                                                        | 14.5                           | 0.16      | B   | 19.5      | 0.13      | B   | 17.2      | 0.18      | B   | 14.8                        | 0.16      | B   | 21.1      | 0.16      | C   | 19.4      | 0.18      | B   | 15.0                        | 0.17      | B   | 22.0      | 0.16      | C   | 19.9      | 0.18      | B   |  |
| WB LT                                                        | 17.4                           | 0.30      | B   | 22.8      | 0.28      | C   | 19.5      | 0.18      | B   | 17.8                        | 0.31      | B   | 24.8      | 0.30      | C   | 22.3      | 0.21      | C   | 18.1                        | 0.32      | B   | 25.9      | 0.33      | C   | 22.9      | 0.23      | C   |  |
| WB TH/RT                                                     | 14.7                           | 0.22      | B   | 19.4      | 0.13      | B   | 17.7      | 0.27      | B   | 15.0                        | 0.21      | B   | 20.9      | 0.14      | C   | 19.9      | 0.29      | B   | 15.2                        | 0.21      | B   | 21.8      | 0.13      | C   | 20.4      | 0.29      | C   |  |
| SB LT                                                        | 66.8                           | 0.72      | E   | 73.0      | 0.73      | E   | 55.6      | 0.77      | E   | 67.6                        | 0.72      | E   | 75.2      | 0.73      | E   | 59.3      | 0.78      | E   | 68.1                        | 0.72      | E   | 76.9      | 0.73      | E   | 60.8      | 0.78      | E   |  |
| SB TH                                                        | 12.9                           | 0.31      | B   | 17.9      | 0.60      | B   | 15.2      | 0.57      | B   | 13.6                        | 0.33      | B   | 18.8      | 0.63      | B   | 16.4      | 0.60      | B   | 14.0                        | 0.34      | B   | 19.5      | 0.64      | B   | 16.9      | 0.62      | B   |  |
| SB RT                                                        | 11.2                           | 0.02      | B   | 13.1      | 0.05      | B   | 11.4      | 0.06      | B   | 11.8                        | 0.02      | B   | 13.6      | 0.05      | B   | 11.9      | 0.06      | B   | 12.1                        | 0.02      | B   | 14.0      | 0.05      | B   | 12.2      | 0.06      | B   |  |
| Overall                                                      | 14.2                           | -         | B   | 16.7      | -         | B   | 15.1      | -         | B   | 14.4                        | -         | B   | 17.5      | -         | B   | 16.0      | -         | B   | 14.5                        | -         | B   | 18.0      | -         | B   | 16.3      | -         | B   |  |
| <b>2: Honoapiilani Highway &amp; Hooihui Road</b>            |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |  |
| NB LT                                                        | 9.8                            | 0.36      | A   | 9.2       | 0.47      | A   | 8.4       | 0.33      | A   | 10.3                        | 0.40      | B   | 10.8      | 0.55      | B   | 8.9       | 0.41      | A   | 10.5                        | 0.43      | B   | 11.8      | 0.59      | B   | 9.5       | 0.44      | A   |  |
| NB TH                                                        | 10.8                           | 0.64      | B   | 9.3       | 0.66      | A   | 8.9       | 0.57      | A   | 11.3                        | 0.68      | B   | 9.5       | 0.68      | A   | 9.0       | 0.62      | A   | 11.8                        | 0.72      | B   | 9.7       | 0.69      | A   | 9.1       | 0.63      | A   |  |
| NB RT                                                        | 0.0                            | 0.00      | A   | 0.0       | 0.00      | A   | 0.0       | 0.00      | A   | 0.0                         | 0.00      | A   | 0.0       | 0.00      | A   | 0.0       | 0.00      | A   | 0.0                         | 0.00      | A   | 0.0       | 0.00      | A   | 0.0       | 0.00      | A   |  |
| EB LT/TH                                                     | 17.3                           | 0.17      | B   | 19.9      | 0.31      | B   | 16.3      | 0.22      | B   | 17.9                        | 0.17      | B   | 21.7      | 0.32      | C   | 18.5      | 0.24      | B   | 18.2                        | 0.18      | B   | 22.8      | 0.32      | C   | 19.4      | 0.24      | B   |  |
| EB RT                                                        | 16.3                           | 0.06      | B   | 18.4      | 0.07      | B   | 15.6      | 0.10      | B   | 16.9                        | 0.07      | B   | 20.1      | 0.07      | C   | 17.7      | 0.10      | B   | 17.1                        | 0.07      | B   | 21.1      | 0.06      | C   | 18.6      | 0.09      | B   |  |
| WB LT                                                        | 19.9                           | 0.28      | B   | 22.0      | 0.20      | C   | 17.7      | 0.14      | B   | 20.8                        | 0.30      | C   | 24.2      | 0.23      | C   | 20.2      | 0.17      | C   | 21.0                        | 0.30      | C   | 25.6      | 0.26      | C   | 21.3      | 0.20      | C   |  |
| WB TH/RT                                                     | 16.3                           | 0.07      | B   | 18.3      | 0.07      | B   | 15.5      | 0.06      | B   | 16.9                        | 0.06      | B   | 20.1      | 0.07      | C   | 17.5      | 0.07      | B   | 17.1                        | 0.07      | B   | 21.1      | 0.07      | C   | 18.4      | 0.06      | B   |  |
| SB LT                                                        | 9.7                            | 0.03      | A   | 8.1       | 0.07      | A   | 8.0       | 0.04      | A   | 10.0                        | 0.03      | B   | 8.3       | 0.07      | A   | 8.0       | 0.04      | A   | 10.3                        | 0.03      | B   | 8.4       | 0.07      | A   | 8.1       | 0.04      | A   |  |
| SB TH                                                        | 15.1                           | 0.77      | B   | 13.2      | 0.77      | B   | 12.5      | 0.73      | B   | 15.6                        | 0.78      | B   | 14.1      | 0.80      | B   | 13.1      | 0.77      | B   | 15.8                        | 0.79      | B   | 14.6      | 0.82      | B   | 13.5      | 0.79      | B   |  |
| SB RT                                                        | 9.5                            | 0.05      | A   | 8.0       | 0.06      | A   | 8.1       | 0.04      | A   | 9.6                         | 0.05      | A   | 8.0       | 0.07      | A   | 7.8       | 0.04      | A   | 9.7                         | 0.05      | A   | 8.0       | 0.06      | A   | 7.9       | 0.04      | A   |  |
| Overall                                                      | 13.3                           | -         | B   | 11.8      | -         | B   | 11.1      | -         | B   | 13.8                        | -         | B   | 12.6      | -         | B   | 11.6      | -         | B   | 14.0                        | -         | B   | 13.1      | -         | B   | 12.0      | -         | B   |  |
| <b>3: Honoapiilani Highway &amp; Akahahele Street</b>        |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |  |
| NB LT                                                        | 42.7                           | 0.77      | D   | 42.6      | 0.81      | D   | 37.1      | 0.76      | D   | 48.9                        | 0.77      | D   | 54.1      | 0.84      | D   | 53.0      | 0.77      | D   | 50.5                        | 0.76      | D   | 57.4      | 0.85      | E   | 56.8      | 0.77      | E   |  |
| NB TH                                                        | 10.6                           | 0.65      | B   | 13.0      | 0.76      | B   | 10.0      | 0.60      | A   | 16.0                        | 0.72      | B   | 34.5      | 0.93      | C   | 28.9      | 0.87      | C   | 17.7                        | 0.77      | B   | 40.0      | 0.94      | D   | 32.9      | 0.89      | C   |  |
| NB RT                                                        | 6.5                            | 0.01      | A   | 5.9       | 0.01      | A   | 6.4       | 0.01      | A   | 9.7                         | 0.04      | A   | 12.3      | 0.09      | B   | 17.6      | 0.18      | B   | 10.3                        | 0.04      | B   | 13.0      | 0.12      | B   | 18.7      | 0.20      | B   |  |
| EB LT                                                        | 44.0                           | 0.72      | D   | 52.9      | 0.77      | D   | 42.6      | 0.71      | D   | 55.2                        | 0.78      | E   | 63.3      | 0.77      | E   | 62.4      | 0.78      | E   | 56.6                        | 0.78      | E   | 66.7      | 0.77      | E   | 66.3      | 0.77      | E   |  |
| EB TH/RT                                                     | 24.0                           | 0.08      | C   | 32.8      | 0.04      | C   | 23.8      | 0.06      | C   | 29.1                        | 0.12      | C   | 46.8      | 0.52      | D   | 44.7      | 0.71      | D   | 30.7                        | 0.13      | C   | 52.1      | 0.63      | D   | 50.3      | 0.77      | D   |  |
| WB LT                                                        | 69.5                           | 0.53      | E   | 65.8      | 0.58      | E   | 51.3      | 0.55      | D   | 43.5                        | 0.76      | D   | 56.4      | 0.81      | E   | 50.5      | 0.85      | D   | 43.3                        | 0.77      | D   | 59.5      | 0.82      | E   | 59.2      | 0.87      | E   |  |
| WB TH                                                        | 25.3                           | 0.03      | C   | 35.5      | 0.03      | D   | 24.8      | 0.03      | C   | 26.8                        | 0.14      | C   | 39.3      | 0.17      | D   | 29.6      | 0.20      | C   | 27.4                        | 0.14      | C   | 42.0      | 0.19      | D   | 32.2      | 0.21      | C   |  |
| WB RT                                                        | 25.2                           | 0.01      | C   | 35.4      | 0.01      | D   | 24.7      | 0.01      | C   | 26.2                        | 0.02      | C   | 38.2      | 0.03      | D   | 28.4      | 0.05      | C   | 26.7                        | 0.03      | C   | 40.6      | 0.03      | D   | 30.9      | 0.05      | C   |  |
| SB LT                                                        | 112.0                          | 0.71      | F   | 126.5     | 0.72      | F   | 110.8     | 0.70      | F   | 58.6                        | 0.79      | E   | 57.5      | 0.79      | E   | 47.7      | 0.81      | D   | 56.4                        | 0.78      | E   | 60.3      | 0.80      | E   | 51.8      | 0.83      | D   |  |
| SB TH                                                        | 15.3                           | 0.84      | B   | 22.9      | 0.88      | C   | 15.5      | 0.83      | B   | 20.1                        | 0.87      | C   | 31.8      | 0.89      | C   | 24.0      | 0.81      | C   | 21.4                        | 0.87      | C   | 37.4      | 0.92      | D   | 27.2      | 0.84      | C   |  |
| SB RT                                                        | 7.8                            | 0.02      | A   | 10.6      | 0.05      | B   | 8.3       | 0.03      | A   | 10.3                        | 0.02      | B   | 14.1      | 0.05      | B   | 13.6      | 0.03      | B   | 10.7                        | 0.02      | B   | 14.5      | 0.05      | B   | 14.2      | 0.03      | B   |  |
| Overall                                                      | 15.7                           | -         | B   | 21.5      | -         | C   | 15.8      | -         | B   | 22.8                        | -         | C   | 37.5      | -         | D   | 32.8      | -         | C   | 24.3                        | -         | C   | 42.2      | -         | D   | 36.8      | -         | D   |  |
| <b>4: Honoapiilani Highway &amp; Lower Honoapiilani Road</b> |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |  |
| NB LT                                                        | 22.4                           | 0.83      | C   | 30.0      | 0.94      | C   | 21.2      | 0.87      | C   | 23.9                        | 0.84      | C   | 34.3      | 0.94      | C   | 26.1      | 0.89      | C   | 25.7                        | 0.85      | C   | 39.2      | 0.95      | D   | 28.8      | 0.89      | C   |  |
| NB TH/RT                                                     | 4.7                            | 0.33      | A   | 4.4       | 0.36      | A   | 2.4       | 0.24      | A   | 4.6                         | 0.35      | A   | 4.5       | 0.40      | A   | 2.8       | 0.31      | A   | 4.5                         | 0.35      | A   | 4.7       | 0.43      | A   | 3.0       | 0.34      | A   |  |
| EB LT/TH                                                     | 25.0                           | 0.19      | C   | 41.7      | 0.38      | D   | 26.8      | 0.28      | C   | 26.6                        | 0.20      | C   | 46.1      | 0.45      | D   | 32.2      | 0.38      | C   | 28.7                        | 0.21      | C   | 50.0      | 0.51      | D   | 35.0      | 0.42      | D   |  |
| EB RT                                                        | 0.0                            | 0.00      | A   | 0.0       | 0.00      | A   | 0.0       | 0.00      | A   | 0.0                         | 0.00      | A   | 0.0       | 0.00      | A   | 0.0       | 0.00      | A   | 0.0                         | 0.00      | A   | 0.0       | 0.00      | A   | 0.0       | 0.00      | A   |  |
| WB LT/TH/RT                                                  | 24.4                           | 0.10      | C   | 42.5      | 0.47      | D   | 25.3      | 0.05      | C   | 26.1                        | 0.11      | C   | 46.3      | 0.48      | D   | 29.7      | 0.05      | C   | 28.0                        | 0.11      | C   | 49.4      | 0.48      | D   | 31.9      | 0.05      | C   |  |
| SB LT                                                        | 50.7                           | 0.74      | D   | 87.3      | 0.72      | F   | 0.0       | 0.00      | A   | 52.8                        | 0.74      | D   | 91.8      | 0.73      | F   | 0.0       | 0.00      | A   | 55.5                        | 0.74      | E   | 96.2      | 0.73      | F   | 0.0       | 0.00      | A   |  |
| SB TH                                                        | 13.0                           | 0.58      | B   | 27.4      | 0.70      | C   | 14.7      | 0.58      | B   | 13.3                        | 0.61      | B   | 29.3      | 0.74      | C   | 16.8      | 0.64      | B   | 13.6                        | 0.63      | B   | 31.6      | 0.77      | C   | 18.2      | 0.67      | B   |  |
| SB RT                                                        | 9.2                            | 0.00      | A   | 19.5      | 0.01      | B   | 11.0      | 0.03      | B   | 9.2                         | 0.01      | A   | 20.0      | 0.01      | C   | 11.8      | 0.05      | B   | 9.1                         | 0.01      | A   | 20.8      | 0.01      | C   | 12.5      | 0.06      | B   |  |
| Overall                                                      | 12.0                           | -         | B   | 20.9      | -         | C   | 12.6      | -         | B   | 12.3                        | -         | B   | 22.4      | -         | C   | 14.0      | -         | B   | 12.7                        | -         | B   | 24.2      | -         | C   | 15.0      | -         | B   |  |

Table 5.7: Base Year 2022 with Mitigation, Future Year 2022 Scenario 2 and Future Year 2022 Scenario 3 Level of Service Summary Cont'd

| Intersection                                                          | Base Year 2022 with Mitigation |           |     |           |           |     |           |           |     | Future Year 2022 Scenario 2 |           |     |           |           |     |           |           |     | Future Year 2022 Scenario 3 |           |     |           |           |     |           |           |     |
|-----------------------------------------------------------------------|--------------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|-----------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|-----------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|
|                                                                       | AM                             |           |     | PM        |           |     | WE        |           |     | AM                          |           |     | PM        |           |     | WE        |           |     | AM                          |           |     | PM        |           |     | WE        |           |     |
|                                                                       | HCM Delay                      | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay                   | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay                   | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS |
| <b>5: Honoapiilani Highway &amp; Kai Malina Parkway/Halawai Drive</b> |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                 | 31.8                           | 0.79      | C   | 43.8      | 0.82      | D   | 35.3      | 0.78      | D   | 34.2                        | 0.79      | C   | 46.6      | 0.82      | D   | 40.0      | 0.79      | D   | 36.3                        | 0.80      | D   | 48.2      | 0.83      | D   | 41.8      | 0.79      | D   |
| NB TH/RT                                                              | 4.1                            | 0.45      | A   | 7.1       | 0.60      | A   | 4.9       | 0.41      | A   | 4.1                         | 0.47      | A   | 7.7       | 0.64      | A   | 5.2       | 0.48      | A   | 4.1                         | 0.47      | A   | 8.3       | 0.67      | A   | 5.4       | 0.51      | A   |
| EB LT/TH                                                              | 30.4                           | 0.16      | C   | 37.0      | 0.22      | D   | 30.2      | 0.25      | C   | 32.8                        | 0.19      | C   | 39.4      | 0.25      | D   | 34.7      | 0.31      | C   | 35.1                        | 0.20      | D   | 40.9      | 0.25      | D   | 36.3      | 0.31      | D   |
| EB RT                                                                 | 30.3                           | 0.01      | C   | 36.2      | 0.03      | D   | 29.5      | 0.04      | C   | 32.5                        | 0.01      | C   | 38.4      | 0.03      | D   | 33.5      | 0.04      | C   | 34.7                        | 0.01      | C   | 39.7      | 0.03      | D   | 35.1      | 0.04      | D   |
| WB LT/TH/RT                                                           | 30.9                           | 0.11      | C   | 38.1      | 0.08      | D   | 29.5      | 0.10      | C   | 32.9                        | 0.11      | C   | 40.7      | 0.09      | D   | 33.9      | 0.12      | C   | 35.1                        | 0.12      | D   | 42.2      | 0.09      | D   | 35.7      | 0.12      | D   |
| SB LT                                                                 | 53.5                           | 0.78      | D   | 73.1      | 0.78      | E   | 59.7      | 0.75      | E   | 56.9                        | 0.79      | E   | 76.8      | 0.78      | E   | 66.1      | 0.76      | E   | 60.2                        | 0.85      | E   | 79.0      | 0.79      | E   | 68.5      | 0.77      | E   |
| SB TH                                                                 | 7.7                            | 0.61      | A   | 12.5      | 0.72      | B   | 8.8       | 0.63      | A   | 8.0                         | 0.63      | A   | 13.6      | 0.75      | B   | 9.5       | 0.68      | A   | 8.2                         | 0.66      | A   | 14.3      | 0.77      | B   | 9.8       | 0.70      | A   |
| SB RT                                                                 | 4.5                            | 0.04      | A   | 6.4       | 0.04      | A   | 5.1       | 0.04      | A   | 4.5                         | 0.05      | A   | 6.5       | 0.04      | A   | 5.1       | 0.05      | A   | 4.4                         | 0.05      | A   | 6.5       | 0.04      | A   | 5.0       | 0.04      | A   |
| Overall                                                               | 8.1                            | -         | A   | 12.1      | -         | B   | 9.3       | -         | A   | 8.3                         | -         | A   | 12.9      | -         | B   | 9.9       | -         | A   | 8.6                         | -         | A   | 13.5      | -         | B   | 10.1      | -         | B   |
| <b>6: Honoapiilani Highway &amp; Kai Ala Drive/Puukolii Road</b>      |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                 | 74.0                           | 0.85      | E   | 78.1      | 0.86      | E   | 39.8      | 0.78      | D   | 74.1                        | 0.85      | E   | 77.8      | 0.86      | E   | 42.3      | 0.79      | D   | 74.1                        | 0.85      | E   | 77.6      | 0.86      | E   | 43.2      | 0.79      | D   |
| NB TH                                                                 | 6.2                            | 0.48      | A   | 9.8       | 0.58      | A   | 8.2       | 0.49      | A   | 6.5                         | 0.50      | A   | 10.8      | 0.63      | B   | 8.8       | 0.56      | A   | 6.8                         | 0.51      | A   | 11.7      | 0.67      | B   | 9.0       | 0.59      | A   |
| NB RT                                                                 | 3.8                            | 0.04      | A   | 5.4       | 0.04      | A   | 5.5       | 0.03      | A   | 3.8                         | 0.04      | A   | 5.5       | 0.04      | A   | 5.4       | 0.03      | A   | 4.0                         | 0.04      | A   | 5.6       | 0.04      | A   | 5.3       | 0.03      | A   |
| EB LT/TH                                                              | 68.7                           | 0.38      | E   | 67.2      | 0.37      | E   | 31.3      | 0.23      | C   | 68.7                        | 0.38      | E   | 67.1      | 0.39      | E   | 34.3      | 0.28      | C   | 68.5                        | 0.40      | E   | 67.0      | 0.40      | E   | 35.4      | 0.30      | D   |
| EB RT                                                                 | 63.3                           | 0.01      | E   | 63.7      | 0.13      | E   | 30.1      | 0.05      | C   | 63.3                        | 0.01      | E   | 63.7      | 0.18      | E   | 32.5      | 0.05      | C   | 62.8                        | 0.01      | E   | 63.6      | 0.20      | E   | 33.3      | 0.05      | C   |
| WB LT                                                                 | 75.0                           | 0.39      | E   | 78.4      | 0.54      | E   | 34.6      | 0.21      | C   | 75.0                        | 0.39      | E   | 78.7      | 0.54      | E   | 38.2      | 0.24      | D   | 75.0                        | 0.39      | E   | 79.2      | 0.55      | E   | 39.6      | 0.25      | D   |
| WB TH/RT                                                              | 64.1                           | 0.10      | E   | 62.5      | 0.03      | E   | 29.9      | 0.03      | C   | 64.1                        | 0.10      | E   | 62.1      | 0.03      | E   | 32.3      | 0.03      | C   | 63.6                        | 0.09      | E   | 61.6      | 0.03      | E   | 33.2      | 0.03      | C   |
| SB LT                                                                 | 82.9                           | 0.69      | F   | 89.0      | 0.78      | F   | 42.4      | 0.58      | D   | 84.8                        | 0.76      | F   | 89.0      | 0.78      | F   | 45.3      | 0.62      | D   | 84.8                        | 0.76      | F   | 89.0      | 0.78      | F   | 46.3      | 0.63      | D   |
| SB TH                                                                 | 10.0                           | 0.52      | B   | 18.1      | 0.73      | B   | 13.6      | 0.73      | B   | 10.5                        | 0.55      | B   | 19.7      | 0.77      | B   | 14.8      | 0.77      | B   | 11.2                        | 0.58      | B   | 21.1      | 0.80      | C   | 15.4      | 0.79      | B   |
| SB RT                                                                 | 6.0                            | 0.03      | A   | 8.5       | 0.07      | A   | 7.4       | 0.05      | A   | 6.0                         | 0.03      | A   | 8.8       | 0.08      | A   | 7.2       | 0.05      | A   | 6.1                         | 0.03      | A   | 9.0       | 0.08      | A   | 7.2       | 0.06      | A   |
| Overall                                                               | 13.9                           | -         | B   | 19.9      | -         | B   | 13.6      | -         | B   | 14.2                        | -         | B   | 20.9      | -         | C   | 14.5      | -         | B   | 14.5                        | -         | B   | 21.8      | -         | C   | 14.9      | -         | B   |
| <b>7: Honoapiilani Highway &amp; Kaanapali Parkway/Halelo Street</b>  |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                 | 40.7                           | 0.75      | D   | 91.4      | 0.85      | F   | 49.6      | 0.71      | D   | 43.5                        | 0.76      | D   | 96.6      | 0.86      | F   | 57.8      | 0.74      | E   | 46.4                        | 0.77      | D   | 99.6      | 0.86      | F   | 61.7      | 0.75      | E   |
| NB TH/RT                                                              | 16.2                           | 0.68      | B   | 22.0      | 0.66      | C   | 13.7      | 0.56      | B   | 16.4                        | 0.69      | B   | 24.0      | 0.70      | C   | 15.1      | 0.61      | B   | 16.2                        | 0.68      | B   | 25.0      | 0.72      | C   | 15.6      | 0.63      | B   |
| EB LT/TH                                                              | 44.2                           | 0.46      | D   | 86.1      | 0.60      | F   | 48.6      | 0.58      | D   | 47.3                        | 0.48      | D   | 92.8      | 0.65      | F   | 56.3      | 0.65      | E   | 50.4                        | 0.49      | D   | 97.5      | 0.69      | F   | 60.0      | 0.67      | E   |
| EB RT                                                                 | 28.3                           | 0.08      | C   | 63.9      | 0.51      | E   | 36.4      | 0.34      | D   | 30.4                        | 0.08      | C   | 68.0      | 0.52      | E   | 42.0      | 0.35      | D   | 32.6                        | 0.08      | C   | 70.6      | 0.52      | E   | 44.7      | 0.35      | D   |
| WB LT/TH/RT                                                           | 44.7                           | 0.18      | D   | 100.0     | 0.23      | F   | 54.7      | 0.32      | D   | 47.8                        | 0.18      | D   | 105.7     | 0.24      | F   | 63.6      | 0.35      | E   | 50.9                        | 0.19      | D   | 108.9     | 0.24      | F   | 67.8      | 0.36      | E   |
| SB LT                                                                 | 46.2                           | 0.57      | D   | 112.3     | 0.72      | F   | 53.9      | 0.50      | D   | 49.3                        | 0.60      | D   | 123.6     | 0.74      | F   | 62.7      | 0.56      | E   | 52.5                        | 0.61      | D   | 130.1     | 0.76      | F   | 66.8      | 0.57      | E   |
| SB TH                                                                 | 22.1                           | 0.75      | C   | 41.1      | 0.88      | D   | 20.8      | 0.76      | C   | 22.6                        | 0.76      | C   | 44.3      | 0.90      | D   | 22.7      | 0.78      | C   | 23.1                        | 0.77      | C   | 46.7      | 0.91      | D   | 23.5      | 0.79      | C   |
| SB RT                                                                 | 9.8                            | 0.08      | A   | 8.2       | 0.11      | A   | 6.9       | 0.13      | A   | 9.7                         | 0.09      | A   | 8.2       | 0.11      | A   | 6.6       | 0.13      | A   | 9.7                         | 0.09      | A   | 8.3       | 0.11      | A   | 6.6       | 0.14      | A   |
| Overall                                                               | 23.7                           | -         | C   | 44.8      | -         | D   | 24.1      | -         | C   | 24.5                        | -         | C   | 47.8      | -         | D   | 26.7      | -         | C   | 25.1                        | -         | C   | 49.8      | -         | D   | 27.9      | -         | C   |
| <b>8: Honoapiilani Highway &amp; Leialii Parkway</b>                  |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                 | 75.8                           | 0.45      | E   | 69.1      | 0.50      | E   | 72.4      | 0.44      | E   | 75.6                        | 0.45      | E   | 73.9      | 0.50      | E   | 71.9      | 0.44      | E   | 75.5                        | 0.45      | E   | 73.7      | 0.50      | E   | 71.7      | 0.44      | E   |
| NB TH/RT                                                              | 8.8                            | 0.70      | A   | 2.4       | 0.75      | A   | 2.9       | 0.60      | A   | 9.0                         | 0.71      | A   | 2.6       | 0.78      | A   | 3.4       | 0.66      | A   | 9.2                         | 0.72      | A   | 2.8       | 0.80      | A   | 3.6       | 0.68      | A   |
| EB LT/TH/RT                                                           | 58.6                           | 0.06      | E   | 57.0      | 0.07      | E   | 50.0      | 0.03      | D   | 58.6                        | 0.06      | E   | 61.4      | 0.07      | E   | 50.0      | 0.03      | D   | 58.6                        | 0.06      | E   | 61.5      | 0.07      | E   | 50.0      | 0.03      | D   |
| WB LT                                                                 | 62.0                           | 0.37      | E   | 62.5      | 0.54      | E   | 58.1      | 0.63      | E   | 62.0                        | 0.37      | E   | 67.4      | 0.56      | E   | 58.1      | 0.63      | E   | 62.0                        | 0.37      | E   | 67.4      | 0.56      | E   | 58.1      | 0.63      | E   |
| WB TH/RT                                                              | 58.6                           | 0.01      | E   | 56.7      | 0.05      | E   | 50.3      | 0.05      | D   | 58.6                        | 0.01      | E   | 60.9      | 0.05      | E   | 50.3      | 0.05      | D   | 58.6                        | 0.01      | E   | 61.0      | 0.05      | E   | 50.3      | 0.05      | D   |
| SB LT                                                                 | 68.8                           | 0.52      | E   | 66.2      | 0.78      | E   | 76.2      | 0.79      | E   | 68.8                        | 0.52      | E   | 74.5      | 0.80      | E   | 78.6      | 0.80      | E   | 68.8                        | 0.52      | E   | 74.5      | 0.80      | E   | 78.6      | 0.80      | E   |
| SB TH/RT                                                              | 5.2                            | 0.51      | A   | 13.3      | 0.83      | B   | 10.2      | 0.70      | B   | 5.5                         | 0.53      | A   | 14.1      | 0.85      | B   | 11.3      | 0.74      | B   | 5.7                         | 0.55      | A   | 15.1      | 0.86      | B   | 11.8      | 0.76      | B   |
| Overall                                                               | 9.1                            | -         | A   | 10.8      | -         | B   | 11.0      | -         | B   | 9.3                         | -         | A   | 11.6      | -         | B   | 11.6      | -         | B   | 9.4                         | -         | A   | 12.1      | -         | B   | 11.9      | -         | B   |
| <b>9: Honoapiilani Highway &amp; Front Street/Flemming Road</b>       |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                 | 89.8                           | 0.73      | F   | 96.3      | 0.74      | F   | 87.9      | 0.84      | F   | 88.9                        | 0.73      | F   | 100.6     | 0.75      | F   | 85.9      | 0.84      | F   | 88.5                        | 0.73      | F   | 98.7      | 0.75      | F   | 85.3      | 0.84      | F   |
| NB TH/RT                                                              | 7.6                            | 0.67      | A   | 1.9       | 0.71      | A   | 16.3      | 0.50      | B   | 7.8                         | 0.68      | A   | 2.4       | 0.74      | A   | 7.6       | 0.55      | A   | 7.9                         | 0.69      | A   | 2.7       | 0.77      | A   | 8.0       | 0.58      | A   |
| EB LT/TH/RT                                                           | 52.6                           | 0.48      | D   | 59.5      | 0.72      | E   | 57.7      | 0.66      | E   | 52.6                        | 0.48      | D   | 65.2      | 0.75      | E   | 57.5      | 0.68      | E   | 53.1                        | 0.50      | D   | 65.4      | 0.75      | E   | 57.6      | 0.68      | E   |
| WB LT/TH/RT                                                           | 54.3                           | 0.61      | D   | 49.7      | 0.24      | D   | 52.3      | 0.32      | D   | 54.3                        | 0.61      | D   | 52.5      | 0.23      | D   | 51.3      | 0.30      | D   | 54.4                        | 0.61      | D   | 52.0      | 0.23      | D   | 50.8      | 0.30      | D   |
| SB LT                                                                 | 88.2                           | 0.81      | F   | 87.4      | 0.74      | F   | 88.0      | 0.82      | F   | 87.7                        | 0.81      | F   | 92.2      | 0.75      | F   | 86.3      | 0.82      | F   | 87.3                        | 0.81      | F   | 90.8      | 0.75      | F   | 85.5      | 0.82      | F   |
| SB TH                                                                 | 4.9                            | 0.48      | A   | 11.8      | 0.79      | B   | 7.7       | 0.64      | A   | 5.1                         | 0.50      | A   | 13.2      | 0.81      | B   | 8.7       | 0.68      | A   | 5.2                         | 0.52      | A   | 13.9      | 0.83      | B   | 9.2       | 0.70      | A   |
| SB RT                                                                 | 3.2                            | 0.11      | A   | 5.6       | 0.24      | A   | 4.3       | 0.17      | A   | 3.2                         | 0.12      | A   | 6.1       | 0.24      | A   | 4.7       | 0.19      | A   | 3.2                         | 0.13      | A   | 6.3       | 0.25      | A   | 4.8       | 0.19      | A   |
| Overall                                                               | 9.9                            | -         | A   | 10.4      | -         | B   | 14.8      | -         | B   | 10.0                        | -         | A   | 11.5      | -         | B   | 11.8      | -         | B   | 10.0                        | -         | B   | 11.9      | -         | B   | 12.1      | -         | B   |

Table 5.7: Base Year 2022 with Mitigation, Future Year 2022 Scenario 2 and Future Year 2022 Scenario 3 Level of Service Summary Cont'd

| Intersection                                           | Base Year 2022 with Mitigation |           |     |           |           |     |           |           |     | Future Year 2022 Scenario 2 |           |     |           |           |     |           |           |     | Future Year 2022 Scenario 3 |           |     |           |           |     |           |           |     |  |
|--------------------------------------------------------|--------------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|-----------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|-----------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|--|
|                                                        | AM                             |           |     | PM        |           |     | WE        |           |     | AM                          |           |     | PM        |           |     | WE        |           |     | AM                          |           |     | PM        |           |     | WE        |           |     |  |
|                                                        | HCM Delay                      | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay                   | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay                   | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS |  |
| <b>10: Honoapiilani Highway &amp; Kapunakea Street</b> |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |  |
| NB LT                                                  | 74.7                           | 0.79      | E   | 67.6      | 0.79      | E   | 71.9      | 0.79      | E   | 74.0                        | 0.79      | E   | 83.9      | 0.82      | F   | 70.4      | 0.79      | E   | 73.5                        | 0.79      | E   | 79.4      | 0.82      | E   | 70.6      | 0.78      | E   |  |
| NB TH/RT                                               | 1.3                            | 0.66      | A   | 1.3       | 0.71      | A   | 2.8       | 0.58      | A   | 1.3                         | 0.68      | A   | 1.2       | 0.74      | A   | 3.6       | 0.64      | A   | 1.3                         | 0.69      | A   | 1.0       | 0.76      | A   | 13.1      | 0.66      | B   |  |
| EB LT/TH                                               | 64.2                           | 0.72      | E   | 62.3      | 0.75      | E   | 59.7      | 0.74      | E   | 64.5                        | 0.72      | E   | 69.3      | 0.77      | E   | 58.0      | 0.75      | E   | 64.5                        | 0.72      | E   | 71.2      | 0.79      | E   | 58.1      | 0.75      | E   |  |
| EB RT                                                  | 48.3                           | 0.01      | D   | 43.6      | 0.03      | D   | 42.6      | 0.04      | D   | 47.9                        | 0.01      | D   | 46.8      | 0.03      | D   | 41.2      | 0.04      | D   | 47.9                        | 0.01      | D   | 46.7      | 0.03      | D   | 40.8      | 0.04      | D   |  |
| WB LT                                                  | 55.1                           | 0.51      | E   | 46.9      | 0.29      | D   | 45.3      | 0.26      | D   | 54.6                        | 0.50      | D   | 50.2      | 0.29      | D   | 43.7      | 0.25      | D   | 54.6                        | 0.50      | D   | 50.1      | 0.29      | D   | 43.3      | 0.24      | D   |  |
| WB TH/RT                                               | 49.3                           | 0.10      | D   | 44.1      | 0.08      | D   | 42.9      | 0.07      | D   | 48.9                        | 0.10      | D   | 47.3      | 0.08      | D   | 41.6      | 0.07      | D   | 48.9                        | 0.10      | D   | 47.3      | 0.08      | D   | 41.2      | 0.07      | D   |  |
| SB LT                                                  | 101.8                          | 0.83      | F   | 72.4      | 0.80      | E   | 85.2      | 0.84      | F   | 101.4                       | 0.83      | F   | 74.3      | 0.79      | E   | 84.3      | 0.84      | F   | 100.9                       | 0.83      | F   | 74.0      | 0.79      | E   | 83.7      | 0.84      | F   |  |
| SB TH/RT                                               | 10.3                           | 0.56      | B   | 5.5       | 0.89      | A   | 3.6       | 0.78      | A   | 10.9                        | 0.58      | B   | 5.9       | 0.90      | A   | 9.9       | 0.83      | A   | 11.2                        | 0.60      | B   | 6.5       | 0.92      | A   | 10.8      | 0.85      | B   |  |
| Overall                                                | 11.9                           | -         | B   | 9.7       | -         | A   | 9.7       | -         | A   | 12.0                        | -         | B   | 10.5      | -         | B   | 12.9      | -         | B   | 12.0                        | -         | B   | 10.8      | -         | B   | 17.2      | -         | B   |  |
| <b>11: Honoapiilani Highway &amp; Keawe Street</b>     |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |  |
| NB LT                                                  | 79.8                           | 0.79      | E   | 69.3      | 0.78      | E   | 64.0      | 0.79      | E   | 79.8                        | 0.79      | E   | 79.7      | 0.78      | E   | 64.0      | 0.79      | E   | 79.8                        | 0.79      | E   | 79.7      | 0.78      | E   | 64.0      | 0.79      | E   |  |
| NB TH                                                  | 32.3                           | 0.62      | C   | 39.4      | 0.75      | D   | 31.0      | 0.55      | C   | 34.9                        | 0.66      | C   | 45.2      | 0.80      | D   | 33.5      | 0.61      | C   | 36.9                        | 0.69      | D   | 50.8      | 0.87      | D   | 34.4      | 0.63      | C   |  |
| NB RT                                                  | 23.6                           | 0.08      | C   | 28.6      | 0.21      | C   | 25.9      | 0.20      | C   | 25.1                        | 0.08      | C   | 31.8      | 0.23      | C   | 27.2      | 0.21      | C   | 26.2                        | 0.08      | C   | 33.6      | 0.23      | C   | 27.6      | 0.21      | C   |  |
| EB LT/TH                                               | 47.7                           | 0.35      | D   | 63.6      | 0.79      | E   | 61.5      | 0.77      | E   | 46.2                        | 0.33      | D   | 57.2      | 0.73      | E   | 62.7      | 0.78      | E   | 44.9                        | 0.32      | D   | 54.1      | 0.69      | D   | 62.8      | 0.78      | E   |  |
| EB RT                                                  | 43.9                           | 0.02      | D   | 42.9      | 0.03      | D   | 44.5      | 0.04      | D   | 42.5                        | 0.01      | D   | 42.5      | 0.03      | D   | 43.6      | 0.04      | D   | 41.4                        | 0.01      | D   | 40.8      | 0.03      | D   | 43.5      | 0.04      | D   |  |
| WB LT                                                  | 38.3                           | 0.29      | D   | 40.7      | 0.58      | D   | 42.2      | 0.62      | D   | 37.1                        | 0.28      | D   | 43.8      | 0.59      | D   | 41.9      | 0.63      | D   | 36.1                        | 0.27      | D   | 40.5      | 0.54      | D   | 41.9      | 0.63      | D   |  |
| WB TH                                                  | 35.5                           | 0.14      | D   | 33.9      | 0.20      | C   | 34.6      | 0.25      | C   | 34.4                        | 0.14      | C   | 35.2      | 0.20      | D   | 33.9      | 0.25      | C   | 33.4                        | 0.14      | C   | 33.6      | 0.19      | C   | 33.8      | 0.24      | C   |  |
| WB RT                                                  | 65.7                           | 0.92      | E   | 64.4      | 0.92      | E   | 43.2      | 0.68      | D   | 66.5                        | 0.93      | E   | 69.0      | 0.93      | E   | 47.6      | 0.78      | D   | 67.3                        | 0.93      | E   | 70.9      | 0.94      | E   | 51.1      | 0.82      | D   |  |
| SB LT                                                  | 51.4                           | 0.91      | D   | 46.4      | 0.95      | D   | 62.2      | 0.88      | E   | 51.2                        | 0.92      | D   | 47.4      | 0.95      | D   | 57.5      | 0.89      | E   | 51.0                        | 0.92      | D   | 46.5      | 0.95      | D   | 57.3      | 0.89      | E   |  |
| SB TH/RT                                               | 1.0                            | 0.45      | A   | 1.3       | 0.70      | A   | 41.1      | 0.58      | D   | 1.1                         | 0.47      | A   | 1.4       | 0.73      | A   | 31.9      | 0.62      | C   | 1.2                         | 0.49      | A   | 1.4       | 0.76      | A   | 32.2      | 0.63      | C   |  |
| Overall                                                | 32.1                           | -         | C   | 32.2      | -         | C   | 43.9      | -         | D   | 32.8                        | -         | C   | 34.3      | -         | C   | 41.2      | -         | D   | 33.4                        | -         | C   | 35.7      | -         | D   | 41.8      | -         | D   |  |
| <b>12: RIRO Access &amp; Honoapiilani Highway</b>      |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |  |
| WB RT                                                  |                                |           |     |           |           |     |           |           |     | 14.3                        | 0.04      | B   | 19.4      | 0.18      | C   | 15.5      | 0.23      | C   | 14.9                        | 0.04      | B   | 20.1      | 0.19      | C   | 16.2      | 0.24      | C   |  |
| Overall                                                |                                |           |     |           |           |     |           |           |     | 0.1                         | -         | -   | 0.5       | -         | -   | 0.9       | -         | -   | 0.1                         | -         | -   | 0.5       | -         | -   | 0.9       | -         | -   |  |
| <b>13: Honoapiilani Highway &amp; Road J</b>           |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |  |
| WB LT                                                  |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     | 32.1                        | 0.35      | D   | 53.7      | 0.46      | F   | 40.7      | 0.40      | E   |  |
| WB RT                                                  |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     | 15.9                        | 0.10      | C   | 24.2      | 0.15      | C   | 18.1      | 0.12      | C   |  |
| SB LT                                                  |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     | 9.7                         | 0.01      | A   | 12.5      | 0.09      | B   | 10.8      | 0.07      | B   |  |
| Overall                                                |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     | 1.5                         | -         | -   | 1.9       | -         | -   | 1.7       | -         | -   |  |
| <b>14: Road A &amp; Akahele Street</b>                 |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |  |
| NB LT/TH/RT                                            |                                |           |     |           |           |     |           |           |     | 11.4                        | 0.08      | B   | 15.6      | 0.22      | C   | 35.5      | 0.54      | E   | 12.1                        | 0.10      | B   | 17.0      | 0.25      | C   | 46.3      | 0.63      | E   |  |
| EB LT                                                  |                                |           |     |           |           |     |           |           |     | 7.5                         | 0.03      | A   | 7.6       | 0.08      | A   | 7.8       | 0.13      | A   | 7.6                         | 0.04      | A   | 7.6       | 0.09      | A   | 7.8       | 0.14      | A   |  |
| WB LT                                                  |                                |           |     |           |           |     |           |           |     | 7.4                         | 0.00      | A   | 7.5       | 0.00      | A   | 7.7       | 0.00      | A   | 7.4                         | 0.00      | A   | 7.6       | 0.00      | A   | 7.7       | 0.00      | A   |  |
| SB LT/TH/RT                                            |                                |           |     |           |           |     |           |           |     | 9.5                         | 0.09      | A   | 11.1      | 0.21      | B   | 10.4      | 0.23      | B   | 9.7                         | 0.10      | A   | 11.5      | 0.22      | B   | 10.6      | 0.24      | B   |  |
| Overall                                                |                                |           |     |           |           |     |           |           |     | 4.6                         | -         | -   | 6.9       | -         | -   | 9.7       | -         | -   | 4.7                         | -         | -   | 6.8       | -         | -   | 11.1      | -         | -   |  |
| <b>15: Road C &amp; Akahele Street</b>                 |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |  |
| NB LT/TH/RT                                            |                                |           |     |           |           |     |           |           |     | 9.0                         | 0.01      | A   | 9.9       | 0.07      | A   | 9.8       | 0.07      | A   | 9.8                         | 0.12      | A   | 10.2      | 0.09      | B   | 10.1      | 0.09      | B   |  |
| EB LT/TH/RT                                            |                                |           |     |           |           |     |           |           |     | 7.3                         | 0.01      | A   | 7.3       | 0.02      | A   | 7.3       | 0.01      | A   | 7.3                         | 0.01      | A   | 7.3       | 0.02      | A   | 7.3       | 0.02      | A   |  |
| WB LT/TH/RT                                            |                                |           |     |           |           |     |           |           |     | 7.3                         | 0.00      | A   | 7.4       | 0.00      | A   | 7.4       | 0.00      | A   | 7.3                         | 0.00      | A   | 7.5       | 0.00      | A   | 7.4       | 0.00      | A   |  |
| SB LT/TH/RT                                            |                                |           |     |           |           |     |           |           |     | 8.8                         | 0.04      | A   | 9.1       | 0.03      | A   | 9.1       | 0.03      | A   | 8.8                         | 0.04      | A   | 9.1       | 0.04      | A   | 9.1       | 0.04      | A   |  |
| Overall                                                |                                |           |     |           |           |     |           |           |     | 4.4                         | -         | -   | 4.3       | -         | -   | 4.6       | -         | -   | 6.5                         | -         | -   | 4.5       | -         | -   | 4.8       | -         | -   |  |
| <b>16: Road G &amp; Road J</b>                         |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |  |
| NB LT/RT                                               |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     | 8.5                         | 0.03      | A   | 9.6       | 0.05      | A   | 9.6       | 0.06      | A   |  |
| WB LT/TH                                               |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     | 7.3                         | 0.00      | A   | 7.5       | 0.00      | A   | 7.5       | 0.00      | A   |  |
| Overall                                                |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     | 2.1                         | -         | -   | 1.9       | -         | -   | 2.1       | -         | -   |  |
| <b>17: Road F &amp; Road J</b>                         |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |  |
| NB LT/RT                                               |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     | 3.6                         | 0.04      | A   | 3.6       | 0.03      | A   | 3.7       | 0.03      | A   |  |
| EB TH/RT                                               |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     | 3.4                         | 0.02      | A   | 4.0       | 0.09      | A   | 3.8       | 0.07      | A   |  |
| WB LT/TH                                               |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     | 3.8                         | 0.05      | A   | 3.6       | 0.03      | A   | 3.6       | 0.04      | A   |  |
| Overall                                                |                                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     | 3.6                         | -         | A   | 3.9       | -         | A   | 3.7       | -         | A   |  |



## 5.5 Future Year 2027 Scenario 4 Analysis

As discussed earlier, a future elementary school will be planned/developed by the Department of Education (DOE). Since the development of the school is not in the direct controller of the Pulelehua development, the timeframe for this school has yet to be determined. For purposes of this TIAR, a forecast build-out of 2027 with inclusion of the elementary school as part of the Project was assumed as Scenario 4 for the TIAR.

By completion of Scenario 4 in Future Year 2027, the Project is projected to generate an additional 312(101)[0] new external trips during the AM(PM)[WE] peak hours of traffic. Elementary school students in Lahaina are currently serviced primarily by Princess Nahienaena Elementary School and King Kamehameha III Elementary School, further south of Keawe Street. It's anticipated that upon opening of the new Elementary School in the Project site, many students will transfer to this site from the Kaanapali, Honokowai, Kahana, Napili and Kapalua regions. Trips generated by the new elementary school were rerouted from existing traffic along Honoapiilani Highway to the new site. As a result, the majority of traffic increases were turning movement traffic turning into and out of Akahele Street on the east leg of its intersection with Honoapiilani Highway. Traffic reductions to various through movements along the highway were a result of the reroute.

### 5.5.1 Future Year 2027 Scenario 4 Intersection Analysis

With the additional trips generated by Scenario 4 and background traffic growth, several study intersections are forecast to operate with increased delay from Base Year 2027 without the Project and Future Year 2022 with Scenarios 1, 2 and 3. All intersection movements forecast to operate at LOS E/F for Future Year 2022 Scenario 3 conditions will continue to operate at LOS E/F conditions during Future Year 2027 Scenario 4.

#### [3] Honoapiilani Highway/Akahele Street

With the increase in turning movements at Akahele Street due to traffic generated by Scenario 4, several minor street and left-turn movements will worsen to LOS E/F during the peak hours of traffic. However, the major through movements will operate at LOS D or better. All left-turn storage lane lengths recommended in Table 5.5 accounts for traffic generated for the Future Year 2027 Scenario 4.

#### [7] Honoapiilani Highway/Kaanapali Parkway

As discussed in Section 4.5.1, this intersection will worsen from overall LOS C(D)[C] during Base Year 2022 to LOS C(E)[C] during Base Year 2027 even without the Project. Therefore, during Future Year 2027 with Project, overall LOS will generally be maintained at LOS C(E)[D]. However, the major through movements will continue operating at LOS D or better during all peak hours. Based on Scenario 4 trip distribution, the Project is anticipated to reduce some of the through traffic along Honoapiilani Highway due to the Elementary School reroutes.

#### [10] Honoapiilani Highway/Kapunakea Street

During the PM peak hour of traffic, the southbound shared through/right-turn movement is expected to operate at over-capacity conditions. The eastbound approach could be restriped to provide an exclusive left-turn lane and a shared through/right-turn lane, consistent with the striping on the westbound approach. With the restriping, all movements will operate under-



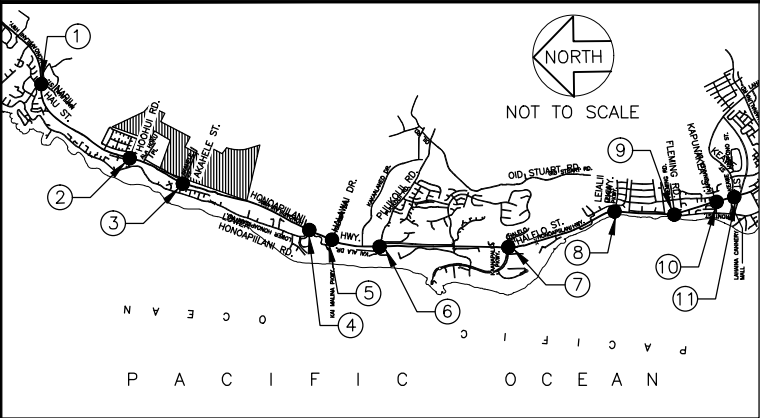
capacity with the major through movements operating at LOS B or better during all peak hours of traffic. Numerous left-turn movements will continue operating at LOS E/F due to the long coordinated cycle length.

#### [11] Honoapiilani Highway/Keawe Street

During the PM peak hour of traffic, the westbound right-turn movement is expected to operate at LOS F and over-capacity conditions because the intersection serves as a critical junction between Honoapiilani Highway and Lahaina Bypass Road. Plans for Lahaina Bypass Road Phase 1C will extend the roadway further north to the Kaanapali area and provide a new connection between the bypass road and Honoapiilani Highway, which will help alleviate the high volume turning movements at the Honoapiilani Highway/Keawe Street intersection. Because there is currently no set completion date for Phase 1C, the bypass extension is not included as a mitigative measure. However, the extension is expected to improve operations at the Honoapiilani Highway/Keawe Street intersection when completed.

Figures 5.8 illustrate the Project-generated trips for Future Year 2027 Scenario 4. Figure 5.9 illustrates the Future Year 2027 Scenario 4 forecast traffic volumes and LOS for the study intersection movements. Table 5.8 summarizes the Future Year 2027 Scenario 4 LOS at the study intersections compared to Base Year 2027 and Future Year 2022 Scenario 3. LOS worksheets are provided in Appendix C. Full Future Year 2022 and 2027 roadway improvements for Scenarios 1-4 are listed in Appendix D.

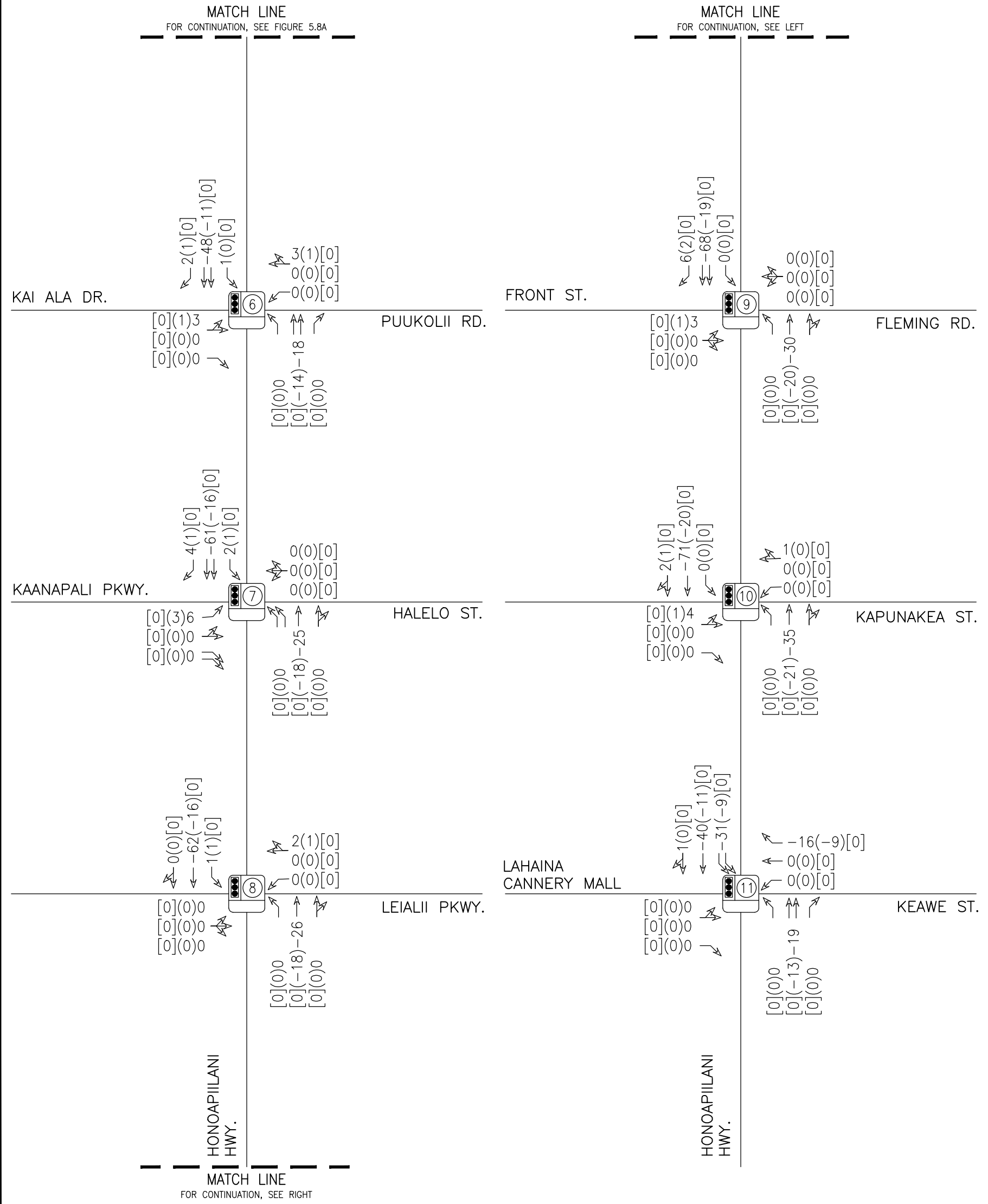




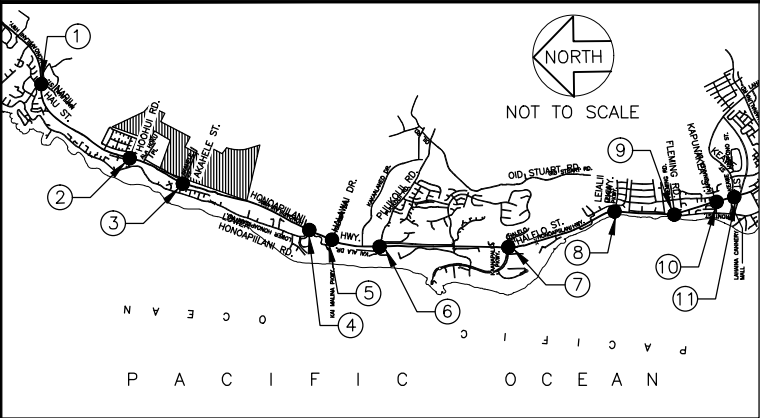
LEGEND

- AA(AA)[AA] - AM(PM)[WE] PEAK HOUR OF TRAFFIC VOLUMES
- SIGNALIZED INTERSECTION Y
- UNSIGNALIZED INTERSECTION X

**NOTE:**  
THIS DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY. DO NOT USE FOR CONSTRUCTION.







LEGEND

- AA(AA)[AA] - AM(PM)[WE] PEAK HOUR OF TRAFFIC VOLUMES
- X(X)[X] - AM(PM)[WE] LOS
-  - SIGNALIZED INTERSECTION Y, OVERALL AM/PM/WE LOS
-  - UNSIGNALIZED INTERSECTION X

**NOTE:**  
THIS DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY. DO NOT USE FOR CONSTRUCTION.

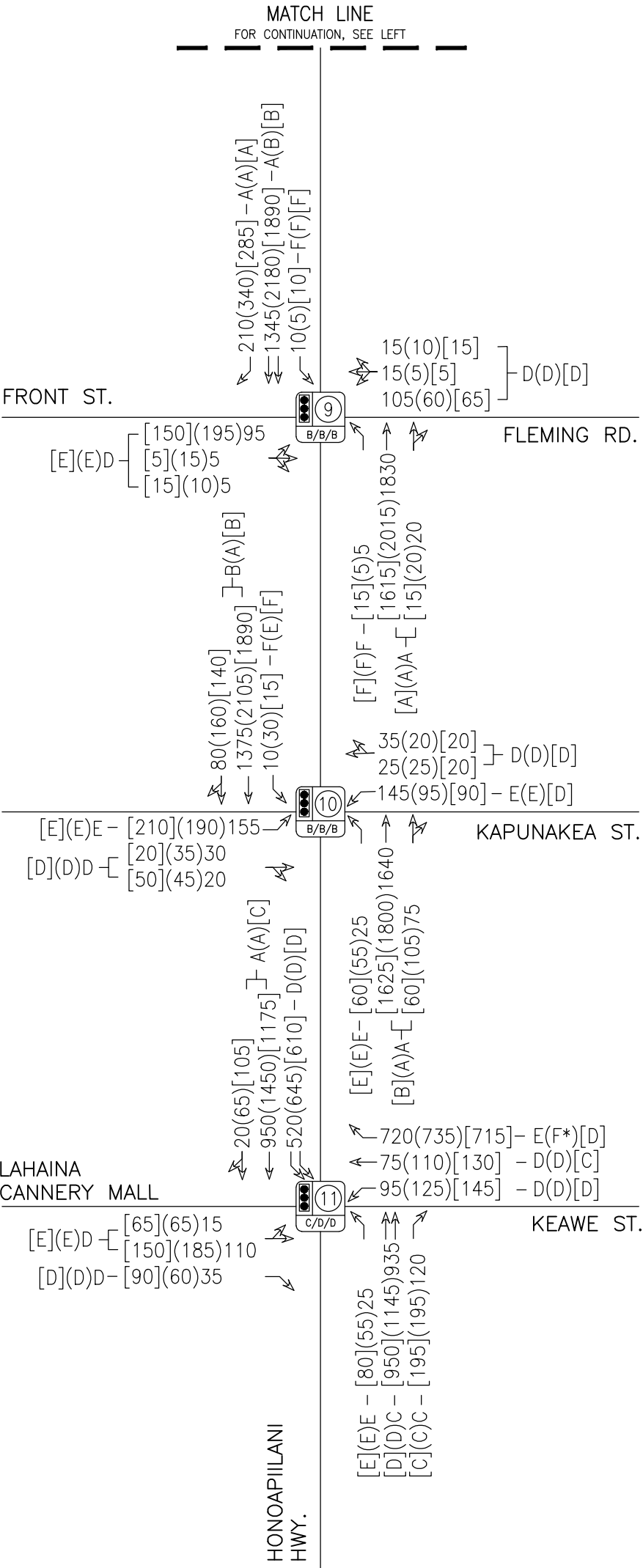
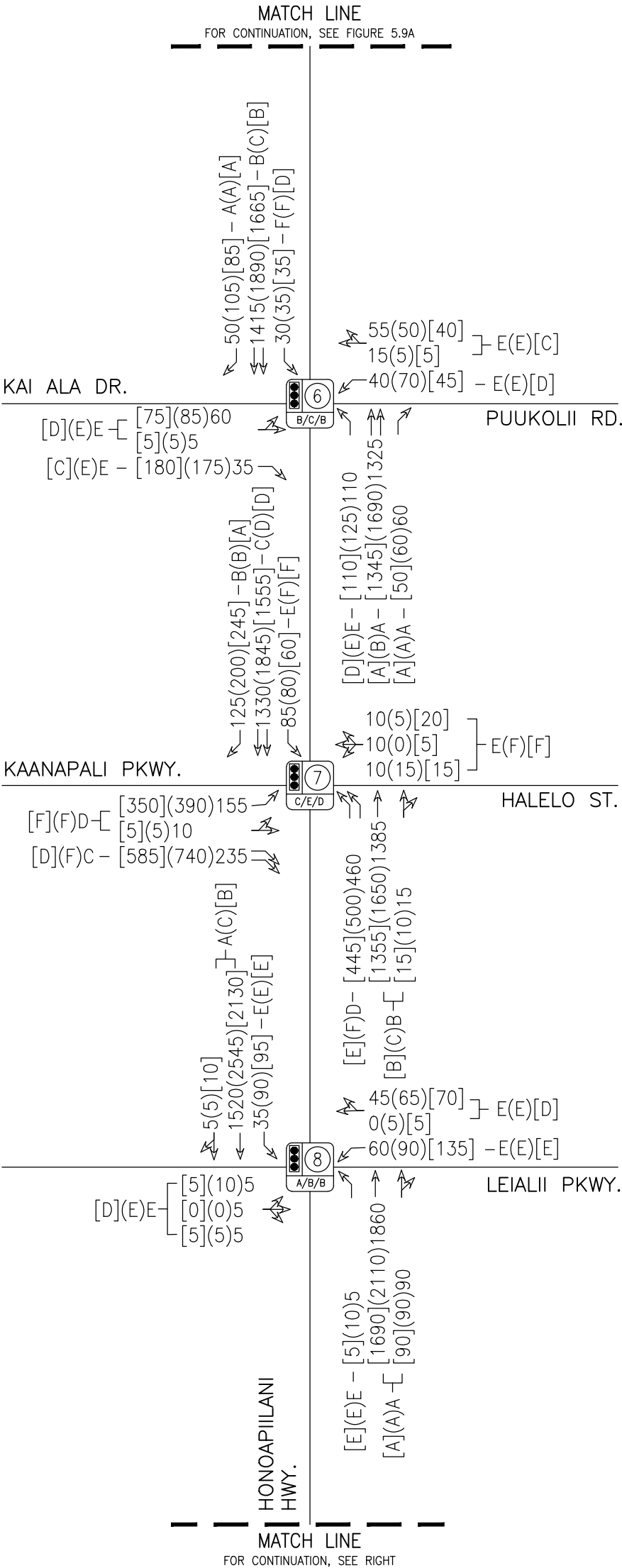


Table 5.8: Base Year 2027, Future Year 2022 Scenario 3 and Future Year 2027 Scenario 4 Level of Service Summary

| Intersection                                                          | Base Year 2027 |           |     |           |           |     |           |           |     | Future Year 2022 Scenario 3 |           |     |           |           |     |           |           |     | Future Year 2027 Scenario 4 |           |     |           |           |     |           |           |     |
|-----------------------------------------------------------------------|----------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|-----------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|-----------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|
|                                                                       | AM             |           |     | PM        |           |     | WE        |           |     | AM                          |           |     | PM        |           |     | WE        |           |     | AM                          |           |     | PM        |           |     | WE        |           |     |
|                                                                       | HCM Delay      | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay                   | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay                   | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS |
| <b>1: Honoapiilani Highway &amp; Napilihau Street</b>                 |                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                 | 18.9           | 0.75      | B   | 23.2      | 0.84      | C   | 22.0      | 0.79      | C   | 18.9                        | 0.76      | B   | 21.5      | 0.85      | C   | 21.2      | 0.81      | C   | 18.8                        | 0.76      | B   | 27.8      | 0.87      | C   | 24.3      | 0.83      | C   |
| NB TH                                                                 | 8.3            | 0.35      | A   | 5.7       | 0.27      | A   | 7.4       | 0.42      | A   | 8.3                         | 0.35      | A   | 5.7       | 0.24      | A   | 7.3       | 0.40      | A   | 8.5                         | 0.39      | A   | 5.7       | 0.28      | A   | 7.3       | 0.44      | A   |
| NB RT                                                                 | 6.9            | 0.08      | A   | 4.7       | 0.05      | A   | 5.4       | 0.03      | A   | 7.0                         | 0.09      | A   | 4.9       | 0.05      | A   | 5.4       | 0.03      | A   | 7.0                         | 0.09      | A   | 4.6       | 0.05      | A   | 5.2       | 0.03      | A   |
| EB LT/TH                                                              | 15.0           | 0.26      | B   | 24.2      | 0.32      | C   | 20.7      | 0.32      | C   | 15.5                        | 0.25      | B   | 22.9      | 0.30      | C   | 20.7      | 0.31      | C   | 15.5                        | 0.26      | B   | 27.2      | 0.32      | C   | 23.5      | 0.32      | C   |
| EB RT                                                                 | 14.5           | 0.15      | B   | 22.8      | 0.12      | C   | 19.7      | 0.16      | B   | 15.0                        | 0.17      | B   | 22.0      | 0.16      | C   | 19.9      | 0.18      | B   | 15.0                        | 0.15      | B   | 25.9      | 0.15      | C   | 22.4      | 0.16      | C   |
| WB LT                                                                 | 17.4           | 0.30      | B   | 27.2      | 0.32      | C   | 22.7      | 0.21      | C   | 18.1                        | 0.32      | B   | 25.9      | 0.33      | C   | 22.9      | 0.32      | C   | 18.1                        | 0.32      | B   | 30.8      | 0.36      | C   | 26.0      | 0.25      | C   |
| WB TH/RT                                                              | 14.7           | 0.22      | B   | 22.9      | 0.14      | C   | 20.3      | 0.29      | C   | 15.2                        | 0.21      | B   | 21.8      | 0.13      | C   | 20.4      | 0.29      | C   | 15.2                        | 0.21      | B   | 25.8      | 0.13      | C   | 23.1      | 0.29      | C   |
| SB LT                                                                 | 66.8           | 0.72      | E   | 78.4      | 0.74      | E   | 60.2      | 0.78      | E   | 68.1                        | 0.72      | E   | 76.9      | 0.73      | E   | 60.8      | 0.78      | E   | 68.1                        | 0.72      | E   | 84.4      | 0.74      | F   | 66.7      | 0.80      | E   |
| SB TH                                                                 | 14.2           | 0.47      | B   | 18.7      | 0.66      | B   | 15.5      | 0.62      | B   | 14.0                        | 0.34      | B   | 19.5      | 0.64      | B   | 16.9      | 0.62      | B   | 15.5                        | 0.51      | B   | 21.3      | 0.70      | C   | 17.9      | 0.66      | B   |
| SB RT                                                                 | 11.2           | 0.02      | B   | 12.8      | 0.05      | B   | 10.9      | 0.06      | B   | 12.1                        | 0.02      | B   | 14.0      | 0.05      | B   | 12.2      | 0.06      | B   | 12.1                        | 0.02      | B   | 14.2      | 0.05      | B   | 12.1      | 0.06      | B   |
| Overall                                                               | 14.3           | -         | B   | 18.1      | -         | B   | 15.7      | -         | B   | 14.5                        | -         | B   | 18.0      | -         | B   | 16.3      | -         | B   | 14.7                        | -         | B   | 20.6      | -         | C   | 17.4      | -         | B   |
| <b>2: Honoapiilani Highway &amp; Hoohui Road</b>                      |                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                 | 10.7           | 0.39      | B   | 11.1      | 0.53      | B   | 8.8       | 0.36      | A   | 10.5                        | 0.43      | B   | 11.8      | 0.59      | B   | 9.5       | 0.44      | A   | 11.8                        | 0.47      | B   | 15.1      | 0.66      | B   | 10.8      | 0.48      | B   |
| NB TH                                                                 | 10.7           | 0.64      | B   | 9.4       | 0.68      | A   | 8.9       | 0.61      | A   | 11.8                        | 0.72      | B   | 9.7       | 0.69      | A   | 9.1       | 0.63      | A   | 11.6                        | 0.71      | B   | 10.0      | 0.71      | B   | 9.4       | 0.67      | A   |
| NB RT                                                                 | 0.0            | 0.00      | A   | 0.0       | 0.00      | A   | 0.0       | 0.00      | A   | 0.0                         | 0.00      | A   | 0.0       | 0.00      | A   | 0.0       | 0.00      | A   | 0.0                         | 0.00      | A   | 0.0       | 0.00      | A   | 0.0       | 0.00      | A   |
| EB LT/TH                                                              | 19.1           | 0.18      | B   | 22.7      | 0.33      | C   | 18.3      | 0.24      | B   | 18.2                        | 0.18      | B   | 22.8      | 0.32      | C   | 19.4      | 0.24      | B   | 20.3                        | 0.18      | C   | 26.5      | 0.34      | C   | 21.4      | 0.25      | C   |
| EB RT                                                                 | 18.0           | 0.06      | B   | 20.9      | 0.06      | C   | 17.4      | 0.08      | B   | 17.1                        | 0.07      | B   | 21.1      | 0.06      | C   | 18.6      | 0.09      | B   | 19.1                        | 0.06      | B   | 24.3      | 0.05      | C   | 20.4      | 0.09      | C   |
| WB LT                                                                 | 22.0           | 0.30      | C   | 25.1      | 0.22      | C   | 19.9      | 0.15      | B   | 21.0                        | 0.30      | C   | 25.6      | 0.26      | C   | 21.3      | 0.20      | C   | 23.5                        | 0.32      | C   | 29.7      | 0.29      | C   | 23.6      | 0.21      | C   |
| WB TH/RT                                                              | 18.0           | 0.07      | B   | 20.9      | 0.07      | C   | 17.4      | 0.07      | B   | 17.1                        | 0.07      | B   | 21.1      | 0.07      | C   | 18.4      | 0.06      | B   | 19.1                        | 0.07      | B   | 24.4      | 0.07      | C   | 20.3      | 0.07      | C   |
| SB LT                                                                 | 9.5            | 0.03      | A   | 8.1       | 0.07      | A   | 7.7       | 0.04      | A   | 10.3                        | 0.03      | B   | 8.4       | 0.07      | A   | 8.1       | 0.04      | A   | 10.1                        | 0.03      | B   | 8.6       | 0.08      | A   | 8.1       | 0.04      | A   |
| SB TH                                                                 | 15.7           | 0.81      | B   | 13.9      | 0.82      | B   | 12.7      | 0.77      | B   | 15.8                        | 0.79      | B   | 14.6      | 0.82      | B   | 13.5      | 0.79      | B   | 16.5                        | 0.82      | B   | 16.6      | 0.86      | B   | 14.1      | 0.82      | B   |
| SB RT                                                                 | 9.2            | 0.04      | A   | 7.6       | 0.06      | A   | 7.5       | 0.04      | A   | 9.7                         | 0.05      | A   | 8.0       | 0.06      | A   | 7.9       | 0.04      | A   | 9.3                         | 0.04      | A   | 7.6       | 0.06      | A   | 7.6       | 0.04      | A   |
| Overall                                                               | 13.8           | -         | B   | 12.6      | -         | B   | 11.4      | -         | B   | 14.0                        | -         | B   | 13.1      | -         | B   | 12.0      | -         | B   | 14.6                        | -         | B   | 14.7      | -         | B   | 12.5      | -         | B   |
| <b>3: Honoapiilani Highway &amp; Akahale Street</b>                   |                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                 | 45.7           | 0.77      | D   | 49.4      | 0.83      | D   | 40.9      | 0.76      | D   | 50.5                        | 0.76      | D   | 57.4      | 0.85      | E   | 56.8      | 0.77      | E   | 53.0                        | 0.76      | D   | 89.0      | 0.89      | F   | 63.9      | 0.78      | E   |
| NB TH                                                                 | 10.0           | 0.63      | B   | 13.8      | 0.77      | B   | 9.8       | 0.63      | A   | 17.7                        | 0.77      | B   | 40.0      | 0.94      | D   | 32.9      | 0.89      | C   | 25.1                        | 0.85      | C   | 44.1      | 0.95      | D   | 40.0      | 0.91      | D   |
| NB RT                                                                 | 6.0            | 0.01      | A   | 5.2       | 0.01      | A   | 5.8       | 0.01      | A   | 10.3                        | 0.04      | B   | 13.0      | 0.12      | B   | 18.7      | 0.20      | B   | 15.3                        | 0.13      | B   | 14.7      | 0.15      | B   | 19.1      | 0.20      | B   |
| EB LT                                                                 | 49.7           | 0.74      | D   | 59.0      | 0.77      | E   | 49.1      | 0.74      | D   | 56.6                        | 0.78      | E   | 66.7      | 0.77      | E   | 66.3      | 0.77      | E   | 58.9                        | 0.78      | E   | 80.1      | 0.77      | F   | 72.8      | 0.77      | E   |
| EB TH/RT                                                              | 27.2           | 0.07      | C   | 38.8      | 0.05      | D   | 27.5      | 0.05      | C   | 30.7                        | 0.13      | C   | 52.1      | 0.63      | D   | 50.3      | 0.77      | D   | 33.2                        | 0.13      | C   | 70.4      | 0.74      | E   | 57.9      | 0.79      | E   |
| WB LT                                                                 | 73.5           | 0.53      | E   | 109.1     | 0.78      | F   | 56.1      | 0.56      | E   | 43.3                        | 0.77      | D   | 59.5      | 0.82      | E   | 59.2      | 0.87      | E   | 43.7                        | 0.81      | D   | 72.5      | 0.85      | E   | 71.8      | 0.89      | E   |
| WB TH                                                                 | 28.7           | 0.03      | C   | 42.2      | 0.04      | D   | 28.7      | 0.03      | C   | 27.4                        | 0.14      | C   | 42.0      | 0.19      | D   | 32.2      | 0.21      | C   | 27.6                        | 0.13      | C   | 52.5      | 0.19      | D   | 37.3      | 0.21      | D   |
| WB RT                                                                 | 28.5           | 0.01      | C   | 42.1      | 0.01      | D   | 28.6      | 0.01      | C   | 26.7                        | 0.03      | C   | 40.6      | 0.03      | D   | 30.9      | 0.05      | C   | 27.1                        | 0.06      | C   | 51.0      | 0.04      | D   | 35.7      | 0.04      | D   |
| SB LT                                                                 | 116.5          | 0.71      | F   | 134.9     | 0.72      | F   | 116.1     | 0.71      | F   | 56.4                        | 0.78      | E   | 60.3      | 0.80      | E   | 51.8      | 0.83      | D   | 44.3                        | 0.79      | D   | 95.3      | 0.87      | F   | 59.1      | 0.85      | E   |
| SB TH                                                                 | 15.8           | 0.86      | B   | 29.0      | 0.92      | C   | 16.1      | 0.85      | B   | 21.4                        | 0.87      | C   | 37.4      | 0.92      | D   | 27.2      | 0.84      | C   | 24.0                        | 0.88      | C   | 43.6      | 0.93      | D   | 33.3      | 0.88      | C   |
| SB RT                                                                 | 7.3            | 0.02      | A   | 9.9       | 0.05      | A   | 7.8       | 0.04      | A   | 10.7                        | 0.02      | B   | 14.5      | 0.05      | B   | 14.2      | 0.03      | B   | 11.8                        | 0.02      | B   | 15.2      | 0.05      | B   | 14.4      | 0.03      | B   |
| Overall                                                               | 15.9           | -         | B   | 25.2      | -         | C   | 16.1      | -         | B   | 24.3                        | -         | C   | 42.2      | -         | D   | 36.8      | -         | D   | 28.9                        | -         | C   | 51.4      | -         | D   | 43.0      | -         | D   |
| <b>4: Honoapiilani Highway &amp; Lower Honoapiilani Road</b>          |                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                 | 24.4           | 0.84      | C   | 38.4      | 0.95      | D   | 23.7      | 0.88      | C   | 25.7                        | 0.85      | C   | 39.2      | 0.95      | D   | 28.8      | 0.89      | C   | 26.9                        | 0.85      | C   | 46.1      | 0.95      | D   | 31.4      | 0.90      | C   |
| NB TH/RT                                                              | 4.5            | 0.33      | A   | 4.3       | 0.37      | A   | 2.3       | 0.26      | A   | 4.5                         | 0.35      | A   | 4.7       | 0.43      | A   | 3.0       | 0.34      | A   | 4.5                         | 0.35      | A   | 4.7       | 0.44      | A   | 3.1       | 0.36      | A   |
| EB LT/TH                                                              | 27.2           | 0.21      | C   | 48.5      | 0.42      | D   | 30.0      | 0.31      | C   | 28.7                        | 0.21      | C   | 50.0      | 0.51      | D   | 35.0      | 0.42      | D   | 30.1                        | 0.24      | C   | 55.4      | 0.53      | E   | 38.1      | 0.44      | D   |
| EB RT                                                                 | 0.0            | 0.00      | A   | 0.0       | 0.00      | A   | 0.0       | 0.00      | A   | 0.0                         | 0.00      | A   | 0.0       | 0.00      | A   | 0.0       | 0.00      | A   | 0.0                         | 0.00      | A   | 0.0       | 0.00      | A   | 0.0       | 0.00      | A   |
| WB LT/TH/RT                                                           | 26.6           | 0.11      | C   | 49.4      | 0.50      | D   | 28.3      | 0.05      | C   | 28.0                        | 0.11      | C   | 49.4      | 0.48      | D   | 31.9      | 0.05      | C   | 29.3                        | 0.12      | C   | 54.6      | 0.50      | D   | 34.7      | 0.05      | C   |
| SB LT                                                                 | 53.6           | 0.74      | D   | 95.5      | 0.73      | F   | 0.0       | 0.00      | A   | 55.5                        | 0.74      | E   | 96.2      | 0.73      | F   | 0.0       | 0.00      | A   | 54.0                        | 0.78      | D   | 102.9     | 0.73      | F   | 0.0       | 0.00      | A   |
| SB TH                                                                 | 13.3           | 0.60      | B   | 30.2      | 0.74      | C   | 15.3      | 0.61      | B   | 13.6                        | 0.63      | B   | 31.6      | 0.77      | C   | 18.2      | 0.67      | B   | 13.9                        | 0.64      | B   | 35.7      | 0.81      | D   | 19.2      | 0.70      | B   |
| SB RT                                                                 | 9.1            | 0.00      | A   | 20.6      | 0.01      | C   | 10.9      | 0.03      | B   | 9.1                         | 0.01      | A   | 20.8      | 0.01      | C   | 12.5      | 0.06      | B   | 9.1                         | 0.01      | A   | 21.8      | 0.01      | C   | 12.7      | 0.06      | B   |
| Overall                                                               | 12.5           | -         | B   | 24.2      | -         | C   | 13.2      | -         | B   | 12.7                        | -         | B   | 24.2      | -         | C   | 15.0      | -         | B   | 13.1                        | -         | B   | 27.4      | -         | C   | 15.8      | -         | B   |
| <b>5: Honoapiilani Highway &amp; Kai Malina Parkway/Halawai Drive</b> |                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                 | 34.6           | 0.80      | C   | 47.4      | 0.82      | D   | 38.4      | 0.78      | D   | 36.3                        | 0.80      | D   | 48.2      | 0.83      | D   | 41.8      | 0.79      | D   | 37.7                        | 0.80      | D   | 50.7      | 0.83      | D   | 44.6      | 0.79      | D   |
| NB TH/RT                                                              | 3.9            | 0.45      | A   | 7.2       | 0.61      | A   | 4.8       | 0.43      | A   | 4.1                         | 0.47      | A   | 8.3       | 0.67      | A   | 5.4       | 0.51      | A   | 4.0                         | 0.47      | A   | 8.5       | 0.68      | A   | 5.5       | 0.52      | A   |
| EB LT/TH                                                              | 33.3           | 0.17      | C   | 40.2      | 0.23      | D   | 33.2      | 0.27      | C   | 35.1                        | 0.20      | D   | 40.9      | 0.25      | D   | 36.3      | 0.31      | D   | 36.6                        | 0.21      | D   | 43.2      | 0.26      | D   | 39.0      | 0.32      | D   |
| EB RT                                                                 | 33.1           | 0.01      | C   | 39.3      | 0.03      | D   | 32.4      | 0.04      | C   | 34.7                        | 0.01      | C   | 39.7      | 0.03      | D   | 35.1      | 0.04      | D   | 36.1                        | 0.01      | D   | 41.9      | 0.03      | D   | 37.6      | 0.04      | D   |
| WB LT/TH/RT                                                           | 33.6           | 0.11      | C   | 41.5      | 0.09      | D   | 32.6      | 0.11      | C   |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |

Table 5.8: Base Year 2027, Future Year 2022 Scenario 3 and Future Year 2027 Scenario 4 Level of Service Summary Cont'd

| Intersection                                                         | Base Year 2027 |           |     |           |           |     |           |           |     | Future Year 2022 Scenario 3 |           |     |           |           |     |           |           |     | Future Year 2027 Scenario 4 |           |     |           |           |     |           |           |     |
|----------------------------------------------------------------------|----------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|-----------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|-----------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|
|                                                                      | AM             |           |     | PM        |           |     | WE        |           |     | AM                          |           |     | PM        |           |     | WE        |           |     | AM                          |           |     | PM        |           |     | WE        |           |     |
|                                                                      | HCM Delay      | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay                   | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay                   | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS |
| <b>6: Honoapiilani Highway &amp; Kai Ala Drive/Puukoihi Road</b>     |                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                | 74.2           | 0.85      | E   | 77.9      | 0.86      | E   | 41.8      | 0.78      | D   | 74.1                        | 0.85      | E   | 77.6      | 0.86      | E   | 43.2      | 0.79      | D   | 74.2                        | 0.85      | E   | 77.5      | 0.86      | E   | 44.5      | 0.79      | D   |
| NB TH                                                                | 6.4            | 0.50      | A   | 10.3      | 0.62      | B   | 8.3       | 0.52      | A   | 6.8                         | 0.51      | A   | 11.7      | 0.67      | B   | 9.0       | 0.59      | A   | 6.9                         | 0.52      | A   | 12.2      | 0.70      | B   | 9.3       | 0.62      | A   |
| NB RT                                                                | 3.8            | 0.04      | A   | 5.3       | 0.04      | A   | 5.3       | 0.03      | A   | 4.0                         | 0.04      | A   | 5.6       | 0.04      | A   | 5.3       | 0.03      | A   | 4.0                         | 0.04      | A   | 5.6       | 0.04      | A   | 5.2       | 0.03      | A   |
| EB LT/TH                                                             | 68.7           | 0.38      | E   | 67.2      | 0.37      | E   | 33.3      | 0.24      | C   | 68.5                        | 0.40      | E   | 67.0      | 0.40      | E   | 35.4      | 0.30      | D   | 68.5                        | 0.40      | E   | 67.0      | 0.40      | E   | 36.8      | 0.31      | D   |
| EB RT                                                                | 63.3           | 0.01      | E   | 63.7      | 0.13      | E   | 32.0      | 0.05      | C   | 62.8                        | 0.01      | E   | 63.6      | 0.20      | E   | 33.3      | 0.05      | C   | 62.8                        | 0.01      | E   | 63.6      | 0.20      | E   | 34.6      | 0.05      | C   |
| WB LT                                                                | 75.0           | 0.39      | E   | 78.4      | 0.54      | E   | 36.9      | 0.23      | D   | 75.0                        | 0.39      | E   | 79.2      | 0.55      | E   | 39.6      | 0.25      | D   | 75.0                        | 0.39      | E   | 79.2      | 0.55      | E   | 41.2      | 0.26      | D   |
| WB TH/RT                                                             | 64.1           | 0.10      | E   | 62.5      | 0.03      | E   | 31.8      | 0.03      | C   | 63.6                        | 0.09      | E   | 61.6      | 0.03      | E   | 33.2      | 0.03      | C   | 63.6                        | 0.09      | E   | 61.6      | 0.03      | E   | 34.5      | 0.03      | C   |
| SB LT                                                                | 82.9           | 0.69      | F   | 89.0      | 0.78      | F   | 44.6      | 0.59      | D   | 84.8                        | 0.76      | F   | 89.0      | 0.78      | F   | 46.3      | 0.63      | D   | 84.8                        | 0.76      | F   | 89.0      | 0.78      | F   | 47.7      | 0.63      | D   |
| SB TH                                                                | 10.6           | 0.56      | B   | 20.1      | 0.79      | C   | 14.4      | 0.76      | B   | 11.2                        | 0.58      | B   | 21.1      | 0.80      | C   | 15.4      | 0.79      | B   | 11.6                        | 0.60      | B   | 23.8      | 0.85      | C   | 16.9      | 0.83      | B   |
| SB RT                                                                | 6.0            | 0.03      | A   | 8.5       | 0.07      | A   | 7.2       | 0.05      | A   | 6.1                         | 0.03      | A   | 9.0       | 0.08      | A   | 7.2       | 0.06      | A   | 6.1                         | 0.03      | A   | 9.0       | 0.09      | A   | 7.1       | 0.06      | A   |
| Overall                                                              | 14.0           | -         | B   | 20.8      | -         | C   | 14.1      | -         | B   | 14.5                        | -         | B   | 21.8      | -         | C   | 14.9      | -         | B   | 14.6                        | -         | B   | 23.1      | -         | C   | 15.7      | -         | B   |
| <b>7: Honoapiilani Highway &amp; Kaanapali Parkway/Halelo Street</b> |                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                | 46.2           | 0.79      | D   | 108.4     | 0.90      | F   | 66.5      | 0.83      | E   | 46.4                        | 0.77      | D   | 99.6      | 0.86      | F   | 61.7      | 0.75      | E   | 49.9                        | 0.80      | D   | 128.9     | 0.92      | F   | 79.1      | 0.85      | E   |
| NB TH/RT                                                             | 15.7           | 0.66      | B   | 21.7      | 0.65      | C   | 16.1      | 0.55      | B   | 16.2                        | 0.68      | B   | 25.0      | 0.72      | C   | 15.6      | 0.63      | B   | 16.2                        | 0.67      | B   | 22.8      | 0.69      | C   | 17.7      | 0.61      | B   |
| EB LT/TH                                                             | 51.0           | 0.49      | D   | 111.1     | 0.79      | F   | 64.5      | 0.61      | E   | 50.4                        | 0.49      | D   | 97.5      | 0.69      | F   | 60.0      | 0.67      | E   | 54.7                        | 0.53      | D   | 136.4     | 0.91      | F   | 80.7      | 0.74      | F   |
| EB RT                                                                | 32.1           | 0.08      | C   | 74.3      | 0.63      | E   | 44.3      | 0.44      | D   | 32.6                        | 0.08      | C   | 70.6      | 0.52      | E   | 44.7      | 0.35      | D   | 34.4                        | 0.08      | C   | 85.9      | 0.70      | F   | 53.5      | 0.45      | D   |
| WB LT/TH/RT                                                          | 51.5           | 0.19      | D   | 116.3     | 0.25      | F   | 77.5      | 0.40      | E   | 50.9                        | 0.19      | D   | 108.9     | 0.24      | F   | 67.8      | 0.36      | E   | 55.5                        | 0.19      | E   | 132.4     | 0.40      | F   | 92.4      | 0.45      | F   |
| SB LT                                                                | 53.2           | 0.60      | D   | 139.3     | 0.76      | F   | 76.4      | 0.58      | E   | 52.5                        | 0.61      | D   | 130.1     | 0.76      | F   | 66.8      | 0.57      | E   | 57.2                        | 0.63      | E   | 129.1     | 0.77      | F   | 90.8      | 0.64      | F   |
| SB TH                                                                | 24.0           | 0.77      | C   | 54.5      | 0.93      | D   | 31.7      | 0.81      | C   | 23.1                        | 0.77      | C   | 46.7      | 0.91      | D   | 23.5      | 0.79      | C   | 25.0                        | 0.78      | C   | 54.1      | 0.93      | D   | 36.1      | 0.84      | D   |
| SB RT                                                                | 10.3           | 0.10      | B   | 11.3      | 0.16      | B   | 9.2       | 0.18      | A   | 9.7                         | 0.09      | A   | 8.3       | 0.11      | A   | 6.6       | 0.14      | A   | 10.3                        | 0.10      | B   | 10.3      | 0.16      | B   | 9.4       | 0.20      | A   |
| Overall                                                              | 25.5           | -         | C   | 56.2      | -         | E   | 34.5      | -         | C   | 25.1                        | -         | C   | 49.8      | -         | D   | 27.9      | -         | C   | 26.8                        | -         | C   | 61.1      | -         | E   | 39.7      | -         | D   |
| <b>8: Honoapiilani Highway &amp; Leialii Parkway</b>                 |                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                | 75.4           | 0.45      | E   | 72.5      | 0.62      | E   | 71.7      | 0.44      | E   | 75.5                        | 0.45      | E   | 73.7      | 0.50      | E   | 71.7      | 0.44      | E   | 75.2                        | 0.45      | E   | 73.0      | 0.50      | E   | 70.9      | 0.44      | E   |
| NB TH/RT                                                             | 9.3            | 0.73      | A   | 2.8       | 0.82      | A   | 3.5       | 0.68      | A   | 9.2                         | 0.72      | A   | 2.8       | 0.80      | A   | 3.6       | 0.68      | A   | 9.5                         | 0.74      | A   | 3.3       | 0.86      | A   | 4.3       | 0.75      | A   |
| EB LT/TH/RT                                                          | 58.6           | 0.06      | E   | 57.0      | 0.07      | E   | 50.0      | 0.03      | D   | 58.6                        | 0.06      | E   | 61.5      | 0.07      | E   | 50.0      | 0.03      | D   | 58.6                        | 0.06      | E   | 61.5      | 0.07      | E   | 50.0      | 0.03      | D   |
| WB LT                                                                | 62.0           | 0.37      | E   | 62.5      | 0.54      | E   | 58.1      | 0.63      | E   | 62.0                        | 0.37      | E   | 67.4      | 0.56      | E   | 58.1      | 0.63      | E   | 62.0                        | 0.37      | E   | 67.4      | 0.56      | E   | 58.1      | 0.63      | E   |
| WB TH/RT                                                             | 58.6           | 0.01      | E   | 56.7      | 0.05      | E   | 50.3      | 0.05      | D   | 58.6                        | 0.01      | E   | 61.0      | 0.05      | E   | 50.3      | 0.05      | D   | 58.6                        | 0.01      | E   | 61.0      | 0.05      | E   | 50.3      | 0.05      | D   |
| SB LT                                                                | 68.8           | 0.52      | E   | 66.2      | 0.78      | E   | 76.2      | 0.79      | E   | 68.8                        | 0.52      | E   | 74.5      | 0.80      | E   | 78.6      | 0.80      | E   | 69.9                        | 0.60      | E   | 74.5      | 0.80      | E   | 78.6      | 0.80      | E   |
| SB TH/RT                                                             | 5.6            | 0.54      | A   | 19.1      | 0.91      | B   | 12.8      | 0.78      | B   | 5.7                         | 0.55      | A   | 15.1      | 0.86      | B   | 11.8      | 0.76      | B   | 5.8                         | 0.56      | A   | 22.4      | 0.93      | C   | 14.8      | 0.83      | B   |
| Overall                                                              | 9.4            | -         | A   | 13.9      | -         | B   | 12.2      | -         | B   | 9.4                         | -         | A   | 12.1      | -         | B   | 11.9      | -         | B   | 9.7                         | -         | A   | 15.9      | -         | B   | 13.4      | -         | B   |
| <b>9: Honoapiilani Highway &amp; Front Street/Fleming Road</b>       |                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                | 88.0           | 0.73      | F   | 93.8      | 0.74      | F   | 85.3      | 0.84      | F   | 88.5                        | 0.73      | F   | 98.7      | 0.75      | F   | 85.3      | 0.84      | F   | 89.2                        | 0.73      | F   | 95.6      | 0.75      | F   | 82.7      | 0.84      | F   |
| NB TH/RT                                                             | 8.0            | 0.70      | A   | 2.5       | 0.77      | A   | 7.5       | 0.58      | A   | 7.9                         | 0.69      | A   | 2.7       | 0.77      | A   | 8.0       | 0.58      | A   | 8.3                         | 0.71      | A   | 3.4       | 0.83      | A   | 8.9       | 0.64      | A   |
| EB LT/TH/RT                                                          | 52.6           | 0.48      | D   | 59.5      | 0.72      | E   | 57.7      | 0.66      | E   | 53.1                        | 0.50      | D   | 65.4      | 0.75      | E   | 57.6      | 0.68      | E   | 53.1                        | 0.50      | D   | 65.6      | 0.76      | E   | 57.6      | 0.68      | E   |
| WB LT/TH/RT                                                          | 54.3           | 0.61      | D   | 49.7      | 0.24      | D   | 52.3      | 0.32      | D   | 54.4                        | 0.61      | D   | 52.0      | 0.23      | D   | 50.8      | 0.30      | D   | 54.4                        | 0.61      | D   | 51.6      | 0.22      | D   | 50.8      | 0.30      | D   |
| SB LT                                                                | 87.5           | 0.81      | F   | 79.4      | 0.74      | E   | 84.1      | 0.82      | F   | 87.3                        | 0.81      | F   | 90.8      | 0.75      | F   | 85.5      | 0.82      | F   | 87.1                        | 0.81      | F   | 83.0      | 0.75      | F   | 81.7      | 0.82      | F   |
| SB TH                                                                | 5.2            | 0.51      | A   | 13.8      | 0.87      | B   | 8.8       | 0.72      | A   | 5.2                         | 0.52      | A   | 13.9      | 0.83      | B   | 9.2       | 0.70      | A   | 5.2                         | 0.52      | A   | 16.7      | 0.91      | B   | 10.4      | 0.77      | B   |
| SB RT                                                                | 3.2            | 0.12      | A   | 5.6       | 0.24      | A   | 4.3       | 0.18      | A   | 3.2                         | 0.13      | A   | 6.3       | 0.25      | A   | 4.8       | 0.19      | A   | 3.2                         | 0.13      | A   | 6.4       | 0.25      | A   | 4.8       | 0.20      | A   |
| Overall                                                              | 10.1           | -         | B   | 11.2      | -         | B   | 11.4      | -         | B   | 10.0                        | -         | B   | 11.9      | -         | B   | 12.1      | -         | B   | 10.2                        | -         | B   | 13.4      | -         | B   | 12.7      | -         | B   |
| <b>10: Honoapiilani Highway &amp; Kapunakea Street**</b>             |                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                                                | 74.0           | 0.79      | E   | 72.5      | 0.79      | E   | 71.1      | 0.78      | E   | 73.5                        | 0.79      | E   | 79.4      | 0.82      | E   | 70.6      | 0.78      | E   | 73.9                        | 0.79      | E   | 74.8      | 0.82      | E   | 68.5      | 0.78      | E   |
| NB TH/RT                                                             | 1.4            | 0.69      | A   | 1.2       | 0.76      | A   | 12.2      | 0.66      | B   | 1.3                         | 0.69      | A   | 1.0       | 0.76      | A   | 13.1      | 0.66      | B   | 1.4                         | 0.69      | A   | 0.7       | 0.80      | A   | 13.5      | 0.72      | B   |
| EB LT                                                                | -              | -         | -   | -         | -         | -   | -         | -         | -   | -                           | -         | -   | -         | -         | -   | -         | -         | -   | 61.5                        | 0.66      | E   | 71.3      | 0.76      | E   | 57.2      | 0.73      | E   |
| EB LT/TH                                                             | 64.2           | 0.72      | E   | 70.5      | 0.80      | E   | 59.7      | 0.74      | E   | 64.5                        | 0.72      | E   | 71.2      | 0.79      | E   | 58.1      | 0.75      | E   | -                           | -         | -   | -         | -         | -   | -         | -         | -   |
| EB TH/RT                                                             | -              | -         | -   | -         | -         | -   | -         | -         | -   | -                           | -         | -   | -         | -         | -   | -         | -         | -   | 49.9                        | 0.12      | D   | 50.6      | 0.16      | D   | 42.4      | 0.08      | D   |
| EB RT                                                                | 48.3           | 0.01      | D   | 45.1      | 0.02      | D   | 42.6      | 0.04      | D   | 47.9                        | 0.01      | D   | 46.7      | 0.03      | D   | 40.8      | 0.04      | D   | -                           | -         | -   | -         | -         | -   | -         | -         | -   |
| WB LT                                                                | 55.1           | 0.51      | E   | 48.5      | 0.31      | D   | 45.3      | 0.26      | D   | 54.6                        | 0.50      | D   | 50.1      | 0.29      | D   | 43.3      | 0.24      | D   | 60.5                        | 0.63      | E   | 57.3      | 0.41      | E   | 46.9      | 0.31      | D   |
| WB TH/RT                                                             | 49.3           | 0.10      | D   | 45.7      | 0.09      | D   | 42.9      | 0.07      | D   | 48.9                        | 0.10      | D   | 47.3      | 0.08      | D   | 41.2      | 0.07      | D   | 49.8                        | 0.10      | D   | 49.8      | 0.09      | D   | 42.3      | 0.07      | D   |
| SB LT                                                                | 101.0          | 0.83      | F   | 72.5      | 0.80      | E   | 82.3      | 0.84      | F   | 100.9                       | 0.83      | F   | 74.0      | 0.79      | E   | 83.7      | 0.84      | F   | 100.7                       | 0.83      | F   | 72.2      | 0.79      | E   | 80.7      | 0.84      | F   |
| SB TH/RT                                                             | 10.9           | 0.59      | B   | 13.4      | 0.96      | B   | 5.4       | 0.87      | A   | 11.2                        | 0.60      | B   | 6.5       | 0.92      | A   | 10.8      | 0.85      | B   | 10.8                        | 0.60      | B   | 8.6       | 0.97      | A   | 12.9      | 0.92      | B   |
| Overall                                                              | 11.9           | -         | B   | 14.3      | -         | B   | 13.8      | -         | B   | 12.0                        | -         | B   | 10.8      | -         | B   | 17.2      | -         | B   | 11.8                        | -         | B   | 11.8      | -         | B   | 18.1      | -         | B   |



Table 5.8: Base Year 2027, Future Year 2022 Scenario 3 and Future Year 2027 Scenario 4 Level of Service Summary Cont'd

| Intersection                                       | Base Year 2027 |           |     |           |           |     |           |           |     | Future Year 2022 Scenario 3 |           |     |           |           |     |           |           |     | Future Year 2027 Scenario 4 |           |     |           |           |     |           |           |     |
|----------------------------------------------------|----------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|-----------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|-----------------------------|-----------|-----|-----------|-----------|-----|-----------|-----------|-----|
|                                                    | AM             |           |     | PM        |           |     | WE        |           |     | AM                          |           |     | PM        |           |     | WE        |           |     | AM                          |           |     | PM        |           |     | WE        |           |     |
|                                                    | HCM Delay      | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay                   | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay                   | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS | HCM Delay | v/c Ratio | LOS |
| <b>11: Honoapiilani Highway &amp; Keawe Street</b> |                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT                                              | 79.8           | 0.79      | E   | 69.3      | 0.78      | E   | 64.0      | 0.79      | E   | 79.8                        | 0.79      | E   | 79.7      | 0.78      | E   | 64.0      | 0.79      | E   | 79.8                        | 0.79      | E   | 74.4      | 0.78      | E   | 64.0      | 0.79      | E   |
| NB TH                                              | 33.6           | 0.66      | C   | 42.7      | 0.85      | D   | 33.9      | 0.68      | C   | 36.9                        | 0.69      | D   | 50.8      | 0.87      | D   | 34.4      | 0.63      | C   | 34.4                        | 0.68      | C   | 51.7      | 0.91      | D   | 38.1      | 0.76      | D   |
| NB RT                                              | 23.8           | 0.08      | C   | 27.6      | 0.21      | C   | 25.7      | 0.20      | C   | 26.2                        | 0.08      | C   | 33.6      | 0.23      | C   | 27.6      | 0.21      | C   | 24.1                        | 0.08      | C   | 30.7      | 0.23      | C   | 27.4      | 0.21      | C   |
| EB LT/TH                                           | 47.3           | 0.34      | D   | 71.3      | 0.84      | E   | 61.6      | 0.77      | E   | 44.9                        | 0.32      | D   | 54.1      | 0.69      | D   | 62.8      | 0.78      | E   | 47.0                        | 0.34      | D   | 57.8      | 0.69      | E   | 62.8      | 0.78      | E   |
| EB RT                                              | 43.5           | 0.01      | D   | 44.2      | 0.02      | D   | 44.4      | 0.04      | D   | 41.4                        | 0.01      | D   | 40.8      | 0.03      | D   | 43.5      | 0.04      | D   | 43.2                        | 0.01      | D   | 44.6      | 0.02      | D   | 43.4      | 0.04      | D   |
| WB LT                                              | 38.1           | 0.29      | D   | 44.9      | 0.63      | D   | 42.2      | 0.62      | D   | 36.1                        | 0.27      | D   | 40.5      | 0.54      | D   | 41.9      | 0.63      | D   | 37.8                        | 0.29      | D   | 38.0      | 0.38      | D   | 41.9      | 0.63      | D   |
| WB TH                                              | 35.3           | 0.14      | D   | 35.2      | 0.21      | D   | 34.6      | 0.25      | C   | 33.4                        | 0.14      | C   | 33.6      | 0.19      | C   | 33.8      | 0.24      | C   | 35.0                        | 0.14      | D   | 35.6      | 0.20      | D   | 33.7      | 0.24      | C   |
| WB RT                                              | 76.2           | 0.95      | E   | 79.9      | 0.97      | E   | 43.7      | 0.70      | D   | 67.3                        | 0.93      | E   | 70.9      | 0.94      | E   | 51.1      | 0.82      | D   | 66.0                        | 0.92      | E   | 105.9     | 1.06      | F*  | 52.0      | 0.83      | D   |
| SB LT                                              | 51.1           | 0.91      | D   | 41.6      | 0.94      | D   | 57.1      | 0.89      | E   | 51.0                        | 0.92      | D   | 46.5      | 0.95      | D   | 57.3      | 0.89      | E   | 51.4                        | 0.91      | D   | 51.4      | 0.98      | D   | 52.0      | 0.90      | D   |
| SB TH/RT                                           | 1.1            | 0.49      | A   | 0.8       | 0.79      | A   | 33.3      | 0.69      | C   | 1.2                         | 0.49      | A   | 1.4       | 0.76      | A   | 32.2      | 0.63      | C   | 1.3                         | 0.50      | A   | 1.2       | 0.83      | A   | 24.0      | 0.72      | C   |
| Overall                                            | 33.3           | -         | C   | 33.2      | -         | C   | 40.4      | -         | D   | 33.4                        | -         | C   | 35.7      | -         | D   | 41.8      | -         | D   | 32.0                        | -         | C   | 39.8      | -         | D   | 38.6      | -         | D   |
| <b>12: RIRO Access &amp; Honoapiilani Highway</b>  |                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| WB RT                                              |                |           |     |           |           |     |           |           |     | 14.9                        | 0.04      | B   | 20.1      | 0.19      | C   | 16.2      | 0.24      | C   | 15.4                        | 0.05      | C   | 22.4      | 0.21      | C   | 17.8      | 0.27      | C   |
| Overall                                            |                |           |     |           |           |     |           |           |     | 0.1                         | -         | -   | 0.5       | -         | -   | 0.9       | -         | -   | 0.1                         | -         | -   | 0.5       | -         | -   | 0.9       | -         | -   |
| <b>13: Honoapiilani Highway &amp; Road J</b>       |                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| WB LT                                              |                |           |     |           |           |     |           |           |     | 32.1                        | 0.35      | D   | 53.7      | 0.46      | F   | 40.7      | 0.40      | E   | 34.3                        | 0.37      | D   | 65.2      | 0.52      | F   | 48.7      | 0.45      | E   |
| WB RT                                              |                |           |     |           |           |     |           |           |     | 15.9                        | 0.10      | C   | 24.2      | 0.15      | C   | 18.1      | 0.12      | C   | 16.2                        | 0.11      | C   | 25.7      | 0.16      | D   | 19.5      | 0.13      | C   |
| SB LT                                              |                |           |     |           |           |     |           |           |     | 9.7                         | 0.01      | A   | 12.5      | 0.09      | B   | 10.8      | 0.07      | B   | 9.7                         | 0.01      | A   | 12.8      | 0.10      | B   | 11.1      | 0.07      | B   |
| Overall                                            |                |           |     |           |           |     |           |           |     | 1.5                         | -         | -   | 1.9       | -         | -   | 1.7       | -         | -   | 1.5                         | -         | -   | 2.0       | -         | -   | 1.8       | -         | -   |
| <b>14: Road A &amp; Akahele Street</b>             |                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT/TH/RT                                        |                |           |     |           |           |     |           |           |     | 12.1                        | 0.10      | B   | 17.0      | 0.25      | C   | 46.3      | 0.63      | E   | 17.6                        | 0.43      | C   | 20.7      | 0.40      | C   | 46.3      | 0.63      | E   |
| EB LT                                              |                |           |     |           |           |     |           |           |     | 7.6                         | 0.04      | A   | 7.6       | 0.09      | A   | 7.8       | 0.14      | A   | 7.5                         | 0.03      | A   | 7.6       | 0.09      | A   | 7.8       | 0.14      | A   |
| WB LT                                              |                |           |     |           |           |     |           |           |     | 7.4                         | 0.00      | A   | 7.6       | 0.00      | A   | 7.7       | 0.00      | A   | 7.8                         | 0.00      | A   | 7.7       | 0.00      | A   | 7.7       | 0.00      | A   |
| SB LT/TH/RT                                        |                |           |     |           |           |     |           |           |     | 9.7                         | 0.10      | A   | 11.5      | 0.22      | B   | 10.6      | 0.24      | B   | 9.8                         | 0.10      | A   | 11.5      | 0.22      | B   | 10.6      | 0.24      | B   |
| Overall                                            |                |           |     |           |           |     |           |           |     | 4.7                         | -         | -   | 6.8       | -         | -   | 11.1      | -         | -   | 6.8                         | -         | -   | 7.8       | -         | -   | 11.1      | -         | -   |
| <b>15: Road C &amp; Akahele Street</b>             |                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT/TH/RT                                        |                |           |     |           |           |     |           |           |     | 9.8                         | 0.12      | A   | 10.2      | 0.09      | B   | 10.1      | 0.09      | B   | 9.7                         | 0.10      | A   | 10.1      | 0.08      | B   | 10.1      | 0.09      | B   |
| EB LT/TH/RT                                        |                |           |     |           |           |     |           |           |     | 7.3                         | 0.01      | A   | 7.3       | 0.02      | A   | 7.3       | 0.02      | A   | 7.3                         | 0.01      | A   | 7.3       | 0.02      | A   | 7.3       | 0.02      | A   |
| WB LT/TH/RT                                        |                |           |     |           |           |     |           |           |     | 7.3                         | 0.00      | A   | 7.5       | 0.00      | A   | 7.4       | 0.00      | A   | 7.3                         | 0.00      | A   | 7.5       | 0.00      | A   | 7.4       | 0.00      | A   |
| SB LT/TH/RT                                        |                |           |     |           |           |     |           |           |     | 8.8                         | 0.04      | A   | 9.1       | 0.04      | A   | 9.1       | 0.04      | A   | 8.8                         | 0.04      | A   | 9.2       | 0.03      | A   | 9.1       | 0.04      | A   |
| Overall                                            |                |           |     |           |           |     |           |           |     | 6.5                         | -         | -   | 4.5       | -         | -   | 4.8       | -         | -   | 6.5                         | -         | -   | 4.2       | -         | -   | 4.8       | -         | -   |
| <b>16: Road G &amp; Road J</b>                     |                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT/RT                                           |                |           |     |           |           |     |           |           |     | 8.5                         | 0.03      | A   | 9.6       | 0.05      | A   | 9.6       | 0.06      | A   | 8.5                         | 0.03      | A   | 9.6       | 0.05      | A   | 9.6       | 0.06      | A   |
| WB LT/TH                                           |                |           |     |           |           |     |           |           |     | 7.3                         | 0.00      | A   | 7.5       | 0.00      | A   | 7.5       | 0.00      | A   | 7.3                         | 0.00      | A   | 7.5       | 0.00      | A   | 7.5       | 0.00      | A   |
| Overall                                            |                |           |     |           |           |     |           |           |     | 2.1                         | -         | -   | 1.9       | -         | -   | 2.1       | -         | -   | 2.1                         | -         | -   | 1.9       | -         | -   | 2.1       | -         | -   |
| <b>17: Road F &amp; Road J</b>                     |                |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |                             |           |     |           |           |     |           |           |     |
| NB LT/RT                                           |                |           |     |           |           |     |           |           |     | 3.6                         | 0.04      | A   | 3.6       | 0.03      | A   | 3.7       | 0.03      | A   | 3.6                         | 0.04      | A   | 3.6       | 0.03      | A   | 3.4       | 0.02      | A   |
| EB TH/RT                                           |                |           |     |           |           |     |           |           |     | 3.4                         | 0.02      | A   | 4.0       | 0.09      | A   | 3.8       | 0.07      | A   | 3.4                         | 0.02      | A   | 4.0       | 0.09      | A   | 3.5       | 0.03      | A   |
| WB LT/TH                                           |                |           |     |           |           |     |           |           |     | 3.8                         | 0.05      | A   | 3.6       | 0.03      | A   | 3.6       | 0.04      | A   | 3.8                         | 0.05      | A   | 3.6       | 0.03      | A   | 3.4       | 0.02      | A   |
| Overall                                            |                |           |     |           |           |     |           |           |     | 3.6                         | -         | A   | 3.9       | -         | A   | 3.7       | -         | A   | 3.6                         | -         | A   | 3.9       | -         | A   | 3.5       | -         | A   |

\* Denotes overcapacity condition, v/c ≥ 1.

\*\* For Future Year 2027 Scenario 4, the analysis for Honoapiilani Highway/Kapunakea Street includes restriping the eastbound approach to provide an exclusive left-turn lane and a shared through/right-turn lane.

## 6. CONCLUSIONS

The Project is located upon approximately 304.255 acres of undeveloped land in Lahaina, bounded by Honoapiilani Highway to the west and the Kapalua Airport to the east. The Project proposes to provide 898 multi-family (MF) residential units, 2 single-family residential lots (for future residential development), an elementary school, a 10-acre park and two (2) retail centers, totaling 70,000 square feet (SF). In addition, a trail will be constructed just east and parallel to Honoapiilani Highway that will provide bike and pedestrian access to link the Project's development north and south of Mahinahina Gulch. The Project will be constructed in six (6) phases, but for purposes of this TIAR, will be analyzed as four (4) scenarios.

Although it is not part of this TIAR, the Project envisions future expansion at the north end of the Project site (currently identified as 2 single-family residential lots) with an additional 302 residential units, bringing the total residential unit count to 1,200 residential units. Future traffic analysis and roadway mitigation measures will be assessed at a later date.

Scenario 1 – Develop Phase 1 with a build-out of early 2022 that includes the following:

- 240 MF residential units north of Akahele Street, with direct access provided by two (2) new Project roadways, Road A and Road C, bisecting Akahele Street.

Scenario 2 - Develop Phase 2 with a build-out of early 2022 that includes the following:

- 240 MF residential units south of Akahele Street with direct access provided by Road A and Road C.
- Retail Area North consisting of 50,000 square feet (SF) of space located on the northeast corner of the Honoapiilani Highway/Akahele Street intersection.
- Retail Area South consisting of 20,000 SF of space located adjacent to Retail Area North on the southeast corner of the Honoapiilani Highway/Akahele Street intersection.
  - o Access to Retail Area North and South will be provided by Road A. Retail Area North will also be serviced by a RIRO access via Honoapiilani Highway.
  - o Based on the developer forecast absorption for the Retail Area North and South component, approximately 15,000 SF of retail space will be occupied by Year 2022, with subsequent occupancy occurring at a pace of 5,000 SF of retail space every 2 years thereafter. Therefore, full build-out and occupancy of Retail Areas North and South will likely occur well beyond Year 2022, but was assumed to be fully built out by Year 2022 for this TIAR.

Scenario 3 – Develop Phases 3-5 with a build-out of late 2022 that include the following:

- 100 MF residential units (Phase 3) south of Akahele Street, with access provided by Road C.
- 318 MF residential units (Phase 3 and Phase 4) south of Mahinahina Gulch, with access provided by a new Project roadway, Road J, intersecting Honoapiilani Highway south of Mahinahina Gulch.
- 2 single-family residential lots north of Akahele Street, with access provided by Road A and Road C.
- 10-acre park south of Mahinahina Gulch, with access provided by Road J.

Scenario 4 – A future elementary school, to be planned/developed by the Department of Education (DOE). Since the development of the school is not in the direct controller of the Pulelehua development, the timeframe for this school has yet to be determined. For purposes of this TIAR, a forecast build-out of 2027 was assumed for the TIAR.

- Assumed 750-student elementary school, with access provided by Road A.

## 6.1 Existing Conditions

In the vicinity of the Project, Honoapiilani Highway services the area as the main thoroughfare that connects the West Maui region. Honoapiilani Highway generally operates as a two (2) lane highway from Napilihau Street to Lower Honoapiilani Road and continues south as a four (4) lane highway from Lower Honoapiilani Road to beyond Keawe Street. In the vicinity of the Project, the intersections along the highway operate with either fixed coordinated signal timing plans or uncoordinated plans with lengthy through volume green times. As a result, numerous mainline left-turn movements and minor street approaches at various study intersections operate at LOS E/F conditions due to lengthy delays from the signal timing plans that favor the through movements along Honoapiilani Highway. Numerous movements also operate with low left-turning volumes (< 25 vehicles), which contribute to the LOS E/F conditions.

However, with the exception of the southbound left-turn movement at the Honoapiilani Highway/Keawe Street intersection, all vehicular movements at each study intersection operate adequately with under-capacity conditions.

## 6.2 Base Year 2022

It is anticipated that by Year 2022, traffic will have increased over existing conditions due to various anticipated new developments in the Lahaina region shown in Figure 4.1 and a 0.5% ambient growth rate, adjusted and applied from HDOT's MRTDM. By Base Year 2022 without the Project, traffic at the study intersections along Honoapiilani Highway is estimated to increase overall by approximately 10-20% on various parts of the corridor during the AM, PM and WE peak hours of traffic.

By Year 2022, it is assumed that various planned roadway improvements will be implemented even without the Project and include the Lahaina Bypass Road Phase 1B-2, an additional southbound left-turn lane for the Honoapiilani Highway/Keawe Street/Lahaina Cannery Mall intersection, resulting in dual southbound left-turn lanes and various widening/restriping improvements at the Honoapiilani Highway/Napilihau Street intersection.

With the anticipated growth in traffic and planned roadway improvements, all study intersections are forecast to operate similar to existing conditions. Overall intersection delays generally increased by only 1-5 seconds at most study intersections. The majority of intersection movements currently operating at LOS E/F conditions will continue to operate similarly in Base Year 2022 and at under-capacity conditions, with the exception of the eastbound shared left-turn/through movement at Honoapiilani Highway/Kaanapali Parkway intersection during the PM peak hour of traffic, which is forecast to operate at LOS F and over-capacity conditions.

### 6.3 Base Year 2022 With Mitigation

The following mitigations were proposed for Base Year 2022.

#### [7] Honoapiilani Highway/Kaanapali Parkway/Halelo Street

- Modify the eastbound approach to incorporate a dedicated left-turn lane, a shared left-turn/through lane and two (2) dedicated right-turn lanes.

With the recommended mitigation, the intersection is anticipated to improve and operate adequately at overall LOS D or better during all peak hours of traffic. Similar to existing conditions, numerous minor street approaches and major street left-turn movements will continue operating at LOS E/F due to the long through movement green time and cycle length.

#### [8-11] Honoapiilani Highway from Leialii Parkway to Keawe Street

Since the Honoapiilani Highway/Keawe Street intersection will be widened to provide dual southbound left-turn lanes, it was assumed that some of the signal timing plans for intersections along the coordinated corridor from Leialii Parkway to Keawe Street would be reoptimized to make signals run more efficient and improve throughput progression.

### 6.4 Base Year 2027

It is anticipated that by Year 2027, traffic will have increased over Base Year 2022 due to various new developments in the region shown in Figure 4.1 and a 0.5% ambient growth rate, adjusted and applied from HDOT's MRTDM. By Base Year 2027 without the Project, traffic at the study intersections along Honoapiilani Highway is estimated to generally increase by an additional 5-10% for most parts along the corridor during the AM, PM and WE peak hours of traffic over Base Year 2022 conditions.

With the anticipated growth in traffic, the majority of study intersections are forecast to operate similar to existing conditions. Overall intersection delays generally increased by only 1-5 seconds at most study intersections. The majority of intersection movements operating at LOS E/F conditions during Base Year 2022 will continue to operate similarly in Base Year 2027.

Select movements at Honoapiilani Highway/Akahele Street and Honoapiilani Highway/Kaanapali Parkway/Halelo Street are expected to experience significant increases in delay. However, no mitigation is proposed for either intersection as all major through movements will continue to operate adequately.

### 6.5 Future Year 2022 Scenario 1

By completion of Scenario 1 in Future Year 2022, the Project is projected to generate a total of 89(125)[106] new external trips during the AM(PM)[WE] peak hours of traffic. Trips generated by the Project are expected to result in growth along major roadways in the study area. All generated traffic will access the site via Honoapiilani Highway at its intersections with Akahele Street.

Due to the relatively minimal traffic increases due to Scenario 1, regional traffic at the study intersections (those not providing direct access to the Project) along Honoapiilani Highway is estimated to increase overall by less than 5%, while local traffic at the study intersections (those providing direct access to the Project) along Honoapiilani Highway is estimated to increase

overall by less than 10% from Base Year 2022 without the Project scenario, during the AM, PM and WE peak hours of traffic.

All study intersections are forecast to operate similar to Base Year 2022 because of the minimal traffic generated by Scenario 1. Based on the AASHTO Green Book, all existing left-turn storage lane lengths at the Honoapiilani Highway/Akahele Street intersection are adequate for the additional traffic generated by Scenario 1.

## 6.6 Future Year 2022 Scenario 2

By completion of Scenario 2 in Future Year 2022, the Project is projected to generate a total of 210(332)[666] new external trips during the AM(PM)[WE] peak hours of traffic. Trips generated by the Project are expected to result in growth along major roadways in the study area. Traffic will access the site via Honoapiilani Highway at its intersections with Akahele Street and the Project's proposed RIRO driveway for Retail Area North.

By Future Year 2022 WITH the cumulative increases of Project Scenarios 1 and 2, regional traffic at the study intersections (those not providing direct access to the Project) along Honoapiilani Highway is estimated to increase overall by approximately 5-15%, while local traffic at the study intersections (those providing direct access to the Project) along Honoapiilani Highway is estimated to increase overall by approximately 10-40% from Base Year 2022 without the Project scenario, during the AM, PM and WE peak hours of traffic.

All study intersections are forecast to operate similar to Future Year 2022 Scenario 1 with the exception of the Honoapiilani Highway/Akahele Street intersection. Since this intersection is the primary access from Honoapiilani Highway into the Project's Scenario 2 site, turning movements into and out of Akahele Street will increase. As a result, the intersection will worsen, but operate adequately from an overall LOS B(C)[B] during the Future Year 2022 Scenario 1 condition to an overall LOS C(D)[C] for the Future Year 2022 Scenario 2. Various left-turn movements will operate at LOS E conditions during all peak hours, due to the long cycle length and increased turning movements at the intersection. However, all movements will continue to operate under capacity. Based on the AASHTO Green Book, various storage lengths are recommended at the intersection as shown in Table 5.5.

The new RIRO access along Honoapiilani Highway was analyzed as a stop-controlled intersection with stop control on the westbound right-turn movement out of Retail Area North. The westbound right-turn movement is expected to operate adequately with LOS C or better during all peak hours. It is recommended that a northbound right-turn deceleration lane be provided for entry into Retail Area North.

With the addition of the Project's bisecting Road A and Road C, forecast traffic indicates that throughput traffic along Akahele Street will continue to operate with low through volumes (under 25 vehicles) at the Road C intersection and slightly higher through volumes, between 50-150 vehicles, at the Road A intersection during all peak hours. The 50-150 vehicles traveling through the Road A intersection will still yield lengthy gaps in throughput traffic along Akahele Street, eliminating long queues for left-turn movements turning off from Akahele Street onto Road A. However, exclusive left-turn storage lanes should be considered to remove left-turns from the through lanes and increase left-turning vehicle sight distance with the proposed median on Akahele Street.

During the WE peak hour, the northbound shared left-turn/through/right-turn lane on Road A is expected to operate at LOS E due to the high left-turn volumes and the high volumes on Akahele Street. However, lengthy gaps are still expected along Akahele Street as a result of the nearby Honoapiilani Highway/Akahele Street signal.

## **6.7 Future Year 2022 Scenario 3**

By completion of Scenario 3 in Future Year 2022, the Project is projected to generate an additional 168(255)[257] new external trips during the AM(PM)[WE] peak hours of traffic. Trips generated by the Project are expected to result in growth along major roadways in the study area. Traffic generated by Project Scenario 3 will access the site via the Honoapiilani Highway/Road J intersection.

By Future Year 2022 WITH the cumulative increases of Project Scenarios 1, 2 and 3, regional traffic at the study intersections (those not providing direct access to the Project) along Honoapiilani Highway is estimated to increase overall by approximately 5-20%, while local traffic at the study intersections (those providing direct access to the Project) along Honoapiilani Highway is estimated to increase overall by approximately 10-50% from Base Year 2022 without the Project scenario, during the AM, PM and WE peak hours of traffic.

All study intersections are forecast to operate similar to Future Year 2022 Scenario 2, with no major changes to LOS or capacity with the exception of the Honoapiilani Highway/Akahele Street intersection. Due to the continued development of areas north of Mahinahina Gulch, turning movements into and out of Akahele Street will increase. As a result, the intersection will worsen, but operate adequately from an overall LOS C(D)[C] during the Future Year 2022 Scenario 2 condition to an overall LOS C(D)[D] for the Future Year 2022 Scenario 3. The majority of left-turn movements will operate at LOS E conditions during all peak hours, however, all movements will continue to operate under capacity. All left-turn storage lane lengths recommended in for Future Year 2022 Scenario 2 accounts for traffic generated for the Future Year 2022 Scenario 3.

The new Honoapiilani Highway/Road J intersection was analyzed as an unsignalized intersection, which includes an exclusive westbound left-turn and westbound right-turn lane, an exclusive southbound left-turn lane and an exclusive northbound right-turn lane. A southbound median refuge lane along Honoapiilani Highway is also recommended, to facilitate westbound vehicles making the left-turn movement from the Full Access onto Honoapiilani Highway. Based on the Manual on Uniform Traffic Control Devices (MUTCD), Federal Highway Administration, dated 2009, Four-Hour Vehicular Volume traffic signal warrant, a traffic signal is not forecast to be warranted. Signal warrant figures are shown in Appendix D. Based on the AASHTO Green Book, various storage lengths are recommended at the intersection.

With the proposed configuration, the westbound left-turn out of the Project is expected to operate at LOS F during the PM peak hour of traffic and LOS E during the WE peak hour of traffic. However, gaps in through traffic along Honoapiilani Highway and the median refuge lane will help facilitate westbound left-turn movements.

## **6.8 Future Year 2027 Scenario 4**

As discussed earlier, a future elementary school will be planned/developed by the Department of Education (DOE). Since the development of the school is not in the direct controller of the Pulelehua development, the timeframe for this school has yet to be determined. For purposes



of this TIAR, a forecast build-out of 2027 with inclusion of the elementary school as part of the Project was assumed as Scenario 4 for the TIAR.

By completion of Scenario 4 in Future Year 2027, the Project is projected to generate an additional 312(101)[0] new external trips during the AM(PM)[WE] peak hours of traffic. Elementary school students in Lahaina are currently serviced primarily by Princess Nahienaena Elementary School and King Kamehameha III Elementary School, further south of Keawe Street. It's anticipated that upon opening of the new Elementary School in the Project site, many students will transfer to this site from the Kaanapali, Honokowai, Kahana, Napili and Kapalua regions. Trips generated by the new elementary school were rerouted from existing traffic along Honoapiilani Highway to the new site. As a result, the majority of traffic increases were turning movement traffic turning into and out of Akahale Street on the east leg of its intersection with Honoapiilani Highway. Traffic reductions to various through movements along the highway were a result of the reroute.

With the additional trips generated by Scenario 4 and background traffic growth, several study intersections are forecast to operate with increased delay from Base Year 2027 without the Project and Future Year 2022 with Scenarios 1, 2 and 3. All intersection movements forecast to operate at LOS E/F for Future Year 2022 Scenario 3 conditions will continue to operate at LOS E/F conditions during Future Year 2027 Scenario 4

However, the majority of movements expected to experience an increase in delay are minor or left-turn movements that will operate at LOS E/F due to long through movement green times and cycle lengths. The southbound shared through/right-turn at Honoapiilani Highway/Kapunakea Street and the westbound right-turn at Honoapiilani Highway/Keawe Street are expected to operate at over-capacity conditions by Future Year 2027 Scenario 4.

The Lahaina Bypass Road Phase 1C is expected to alleviate some through traffic in the Lahaina area and reduce turning movement volumes at Honoapiilani Highway/Keawe Street by providing an additional connection between the bypass road and the highway. Because there is currently no set completion date for Phase 1C, the bypass extension is not included as a mitigative measure. However, the extension is expected to improve operations at both the Honoapiilani Highway/Kapunakea Street and Honoapiilani Highway/Keawe Street intersections when completed. Additional mitigation is proposed for Honoapiilani Highway/Kapunakea Street.



## 7. RECOMMENDATIONS

Full Base Year and Future Year 2022 and 2027 roadway improvements are listed in Appendix D and discussed in more detail below.

### 7.1 Planned Roadway Improvements

The following roadway improvements are planned to be constructed by other entities by Year 2022.

#### Lahaina Bypass Road Phase 1B-2

- Phase 1B-2 will extend LBR from Hokiokio Place to its southern terminus with Honoapiilani Highway and is expected to be completed in January 2018.

#### Honoapiilani Highway/Keawe Street/Lahaina Cannery Mall

- An additional southbound left-turn lane is planned for the Honoapiilani Highway/Keawe Street/Lahaina Cannery Mall intersection, resulting in dual southbound left-turn lanes.
- Since the Honoapiilani Highway/Keawe Street intersection will be widened to provide dual southbound left-turn lanes, it was assumed that some of the signal timing plans for intersections along the coordinated corridor from Leialii Parkway to Keawe Street would be reoptimized to make signals run more efficient and improve throughput progression.

#### Honoapiilani Highway/Napili Hau Street

- An exclusive right-turn lane on the northbound Honoapiilani Highway approach and exclusive left-turn lane and shared through/right-turn lane on the westbound Napili Hau Street approach will be constructed as part of West Maui Village roadway improvements.

### 7.2 Base Year 2022 Mitigation

The following mitigations are proposed for Base Year 2022 by other entities.

#### [7] Honoapiilani Highway/Kaanapali Parkway/Halelo Street

- Modify the eastbound approach to incorporate a dedicated left-turn lane, a shared left-turn/through lane and two (2) dedicated right-turn lanes.

### 7.3 Future Year 2022 Scenario 2 Mitigation

The following mitigations are proposed for Future Year 2022 Scenario 2.

#### [3] Honoapiilani Highway/Akahele Street

- Optimize existing signal timing to accommodate turning movement increases
- Lengthen existing left-turn storage lane lengths to provide the following storage space. Note, storage lane lengths shown below are exclusive of taper length or deceleration length and will need to be verified upon design:





- o Northbound left-turn lane → Lengthen left-turn lane to provide at least 275 feet of storage space.
- o Southbound left-turn lane → Lengthen left-turn lane to provide at least 275 feet of storage space.
- o Westbound left-turn lane → Lengthen left-turn lane to provide at least 300 feet of storage space.

#### [12] Honoapiilani Highway/Retail Area North RIRO

- Provide a new RIRO access for direct entry/exit to Retail Area North via Honoapiilani Highway. Storage lane lengths shown below are exclusive of deceleration/taper length and will need to be verified upon design. Based on AASHTO Green Book, 425 feet accommodates full deceleration length with a design speed of 50 mph.
  - o Northbound right-turn lane → Provide at least 100 feet of storage space.

#### [14-15] Akahele Street intersection with Road A and Road C

- Consider providing exclusive left-turn storage lanes along Akahele Street at its intersections with Road A and Road C to remove left-turns from the through lanes along Akahele Street.

### **7.4 Future Year 2027 Scenario 3 Mitigation**

#### [13] Honoapiilani Highway/Road J

- Provide a new unsignalized stop-controlled intersection south of the existing Honoapiilani Highway/Akahele Street intersection, with the westbound approach as the stopped approach:
  - o Northbound Approach → Provide one (1) through lane and a new right-turn deceleration lane with at least 100 feet of storage space. Additional taper and/or deceleration length to be provided based upon design. AASHTO Green Book recommends 425 feet for full deceleration length with a design speed of 50 mph.
  - o Southbound Approach → Provide one (1) through lane and a new right-turn deceleration lane with at least 100 feet of storage space. Additional taper and/or deceleration length to be provided based upon design. AASHTO Green Book recommends 425 feet for full deceleration length with a design speed of 50 mph.
    - Construct a median refuge lane to facilitate westbound left-turn traffic exiting Road J going onto Honoapiilani Highway.
  - o Westbound Approach → Provide a new left-turn storage lane and a new 100 feet right-turn storage lane.

### **7.5 Future Year 2027 Scenario 4 Mitigation**

#### [10] Honoapiilani Highway/Kapunakea Street

- Restripe the eastbound approach to provide an exclusive left-turn lane and a shared through/right-turn lane.



## 8. REFERENCES

1. American Association of State Highway and Transportation Officials, A Policy on Geometric Design of Highways and Streets, 2011.
2. Federal Highway Administration, Manual on Uniform Traffic Control Devices, 2009.
3. Institute of Transportation Engineers, Trip Generation, 9<sup>th</sup> Edition, 2012.
4. Transportation Research Board, Highway Capacity Manual, 2010.



---

# APPENDICES

---



---

---

# APPENDIX A

## TRAFFIC COUNT DATA

---

---

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : AM\_Honoapiilani Hwy - Napili Hau St

Site Code : 00000000

Start Date : 12/1/2016

Page No : 1

## Groups Printed- Unshifted

|             | HONOAPIILANI HWY<br>Southbound |      |       |      | NAPILIHAI ST<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |      | NAPILIHAI ST<br>Eastbound |      |       |      |            |
|-------------|--------------------------------|------|-------|------|---------------------------|------|-------|------|--------------------------------|------|-------|------|---------------------------|------|-------|------|------------|
| Start Time  | Left                           | Thru | Right | Peds | Left                      | Thru | Right | Peds | Left                           | Thru | Right | Peds | Left                      | Thru | Right | Peds | Int. Total |
| 06:15 AM    | 0                              | 16   | 6     | 0    | 1                         | 0    | 0     | 0    | 19                             | 24   | 2     | 0    | 10                        | 0    | 30    | 0    | 108        |
| 06:30 AM    | 0                              | 24   | 5     | 2    | 1                         | 1    | 0     | 0    | 28                             | 23   | 4     | 0    | 12                        | 2    | 71    | 0    | 173        |
| 06:45 AM    | 0                              | 28   | 4     | 0    | 5                         | 2    | 2     | 0    | 41                             | 49   | 4     | 0    | 8                         | 4    | 67    | 0    | 214        |
| Total       | 0                              | 68   | 15    | 2    | 7                         | 3    | 2     | 0    | 88                             | 96   | 10    | 0    | 30                        | 6    | 168   | 0    | 495        |
| 07:00 AM    | 1                              | 19   | 2     | 1    | 7                         | 2    | 1     | 0    | 43                             | 32   | 5     | 0    | 7                         | 0    | 82    | 0    | 202        |
| 07:15 AM    | 0                              | 37   | 6     | 0    | 3                         | 3    | 0     | 0    | 61                             | 50   | 8     | 0    | 16                        | 5    | 87    | 0    | 276        |
| 07:30 AM    | 0                              | 12   | 2     | 1    | 1                         | 2    | 1     | 0    | 18                             | 31   | 6     | 0    | 7                         | 6    | 47    | 0    | 134        |
| 07:45 AM    | 2                              | 27   | 6     | 1    | 20                        | 14   | 4     | 0    | 60                             | 61   | 46    | 0    | 11                        | 20   | 76    | 0    | 348        |
| Total       | 3                              | 95   | 16    | 3    | 31                        | 21   | 6     | 0    | 182                            | 174  | 65    | 0    | 41                        | 31   | 292   | 0    | 960        |
| 08:00 AM    | 3                              | 41   | 16    | 1    | 28                        | 9    | 5     | 0    | 63                             | 62   | 24    | 0    | 14                        | 6    | 61    | 0    | 333        |
| Grand Total | 6                              | 204  | 47    | 6    | 66                        | 33   | 13    | 0    | 333                            | 332  | 99    | 0    | 85                        | 43   | 521   | 0    | 1788       |
| Apprch %    | 2.3                            | 77.6 | 17.9  | 2.3  | 58.9                      | 29.5 | 11.6  | 0    | 43.6                           | 43.5 | 13    | 0    | 13.1                      | 6.6  | 80.3  | 0    |            |
| Total %     | 0.3                            | 11.4 | 2.6   | 0.3  | 3.7                       | 1.8  | 0.7   | 0    | 18.6                           | 18.6 | 5.5   | 0    | 4.8                       | 2.4  | 29.1  | 0    |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

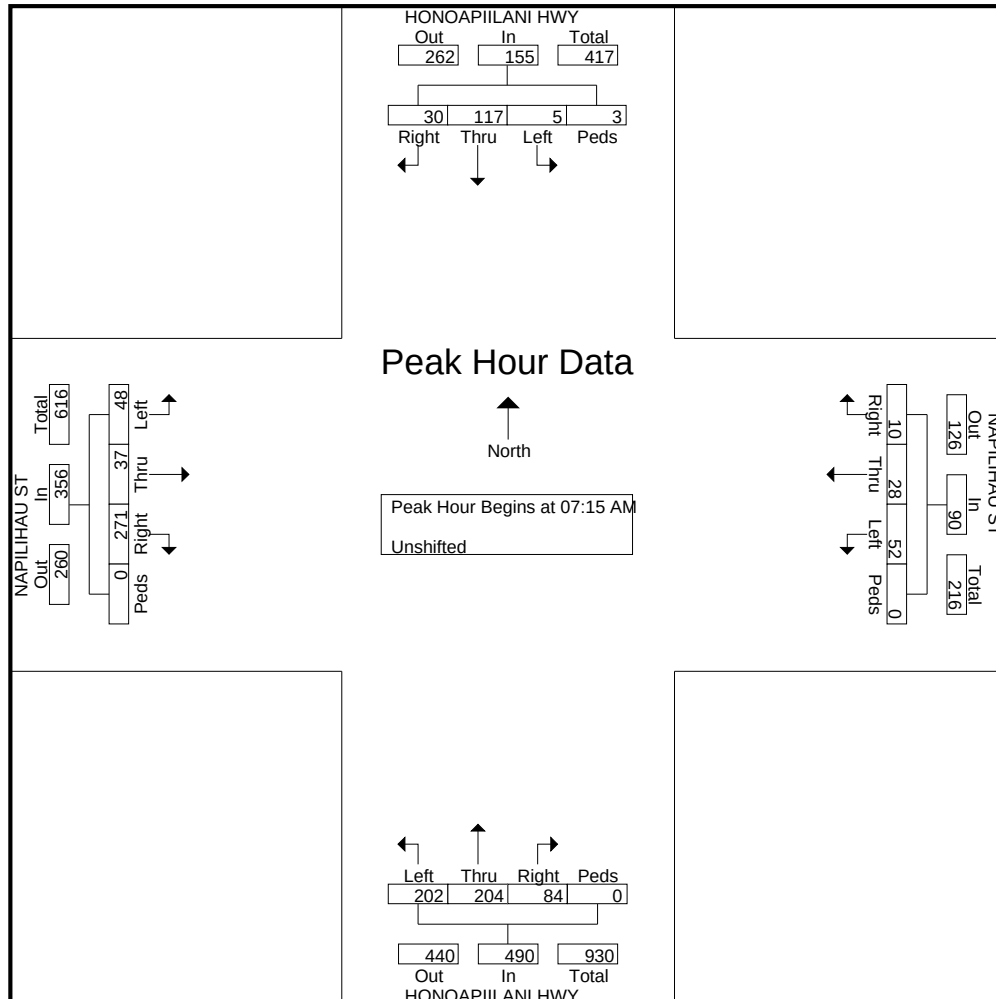
File Name : AM\_Honoapiilani Hwy - Napilihau St

Site Code : 00000000

Start Date : 12/1/2016

Page No : 2

|                                                                   | HONOAPIILANI HWY<br>Southbound |      |       |      |            | NAPILHAU ST<br>Westbound |      |       |      |            | HONOAPIILANI HWY<br>Northbound |      |       |      |            | NAPILHAU ST<br>Eastbound |      |       |      |            |            |
|-------------------------------------------------------------------|--------------------------------|------|-------|------|------------|--------------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|--------------------------|------|-------|------|------------|------------|
| Start Time                                                        | Left                           | Thru | Right | Peds | App. Total | Left                     | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Left                     | Thru | Right | Peds | App. Total | Int. Total |
| <b>Peak Hour Analysis From 06:15 AM to 08:00 AM - Peak 1 of 1</b> |                                |      |       |      |            |                          |      |       |      |            |                                |      |       |      |            |                          |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 07:15 AM              |                                |      |       |      |            |                          |      |       |      |            |                                |      |       |      |            |                          |      |       |      |            |            |
| 07:15 AM                                                          | 0                              | 37   | 6     | 0    | 43         | 3                        | 3    | 0     | 0    | 6          | 61                             | 50   | 8     | 0    | 119        | 16                       | 5    | 87    | 0    | 108        | 276        |
| 07:30 AM                                                          | 0                              | 12   | 2     | 1    | 15         | 1                        | 2    | 1     | 0    | 4          | 18                             | 31   | 6     | 0    | 55         | 7                        | 6    | 47    | 0    | 60         | 134        |
| 07:45 AM                                                          | 2                              | 27   | 6     | 1    | 36         | 20                       | 14   | 4     | 0    | 38         | 60                             | 61   | 46    | 0    | 167        | 11                       | 20   | 76    | 0    | 107        | 348        |
| 08:00 AM                                                          | 3                              | 41   | 16    | 1    | 61         | 28                       | 9    | 5     | 0    | 42         | 63                             | 62   | 24    | 0    | 149        | 14                       | 6    | 61    | 0    | 81         | 333        |
| Total Volume                                                      | 5                              | 117  | 30    | 3    | 155        | 52                       | 28   | 10    | 0    | 90         | 202                            | 204  | 84    | 0    | 490        | 48                       | 37   | 271   | 0    | 356        | 1091       |
| % App. Total                                                      | 3.2                            | 75.5 | 19.4  | 1.9  |            | 57.8                     | 31.1 | 11.1  | 0    |            | 41.2                           | 41.6 | 17.1  | 0    |            | 13.5                     | 10.4 | 76.1  | 0    |            |            |
| PHF                                                               | .417                           | .713 | .469  | .750 | .635       | .464                     | .500 | .500  | .000 | .536       | .802                           | .823 | .457  | .000 | .734       | .750                     | .463 | .779  | .000 | .824       | .784       |



# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : AM\_Honoapiilani Hwy - Hoohui Rd

Site Code : 00000000

Start Date : 12/1/2016

Page No : 1

## Groups Printed- Unshifted

|             | HONOAPIILANI HWY<br>Southbound |      |       |      | HOOHUI RD<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |      | HOOHUI RD<br>Eastbound |      |       |      |            |
|-------------|--------------------------------|------|-------|------|------------------------|------|-------|------|--------------------------------|------|-------|------|------------------------|------|-------|------|------------|
| Start Time  | Left                           | Thru | Right | Peds | Left                   | Thru | Right | Peds | Left                           | Thru | Right | Peds | Left                   | Thru | Right | Peds | Int. Total |
| 06:15 AM    | 0                              | 43   | 8     | 1    | 5                      | 0    | 0     | 1    | 6                              | 43   | 1     | 0    | 8                      | 0    | 23    | 0    | 139        |
| 06:30 AM    | 0                              | 80   | 8     | 0    | 12                     | 3    | 3     | 0    | 7                              | 47   | 1     | 0    | 8                      | 2    | 32    | 0    | 203        |
| 06:45 AM    | 0                              | 96   | 10    | 1    | 12                     | 2    | 5     | 0    | 14                             | 74   | 3     | 0    | 10                     | 0    | 35    | 0    | 262        |
| Total       | 0                              | 219  | 26    | 2    | 29                     | 5    | 8     | 1    | 27                             | 164  | 5     | 0    | 26                     | 2    | 90    | 0    | 604        |
| 07:00 AM    | 1                              | 107  | 10    | 1    | 22                     | 5    | 2     | 0    | 15                             | 62   | 5     | 0    | 10                     | 0    | 48    | 0    | 288        |
| 07:15 AM    | 1                              | 113  | 19    | 2    | 36                     | 6    | 2     | 1    | 23                             | 89   | 1     | 1    | 11                     | 0    | 36    | 0    | 341        |
| 07:30 AM    | 1                              | 89   | 19    | 5    | 18                     | 3    | 4     | 3    | 24                             | 110  | 3     | 0    | 15                     | 1    | 54    | 0    | 349        |
| 07:45 AM    | 6                              | 111  | 10    | 2    | 16                     | 6    | 3     | 2    | 37                             | 117  | 5     | 0    | 19                     | 2    | 41    | 0    | 377        |
| Total       | 9                              | 420  | 58    | 10   | 92                     | 20   | 11    | 6    | 99                             | 378  | 14    | 1    | 55                     | 3    | 179   | 0    | 1355       |
| 08:00 AM    | 1                              | 119  | 13    | 1    | 14                     | 3    | 4     | 0    | 39                             | 137  | 4     | 0    | 13                     | 0    | 32    | 0    | 380        |
| Grand Total | 10                             | 758  | 97    | 13   | 135                    | 28   | 23    | 7    | 165                            | 679  | 23    | 1    | 94                     | 5    | 301   | 0    | 2339       |
| Apprch %    | 1.1                            | 86.3 | 11    | 1.5  | 69.9                   | 14.5 | 11.9  | 3.6  | 19                             | 78.2 | 2.6   | 0.1  | 23.5                   | 1.2  | 75.2  | 0    |            |
| Total %     | 0.4                            | 32.4 | 4.1   | 0.6  | 5.8                    | 1.2  | 1     | 0.3  | 7.1                            | 29   | 1     | 0    | 4                      | 0.2  | 12.9  | 0    |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

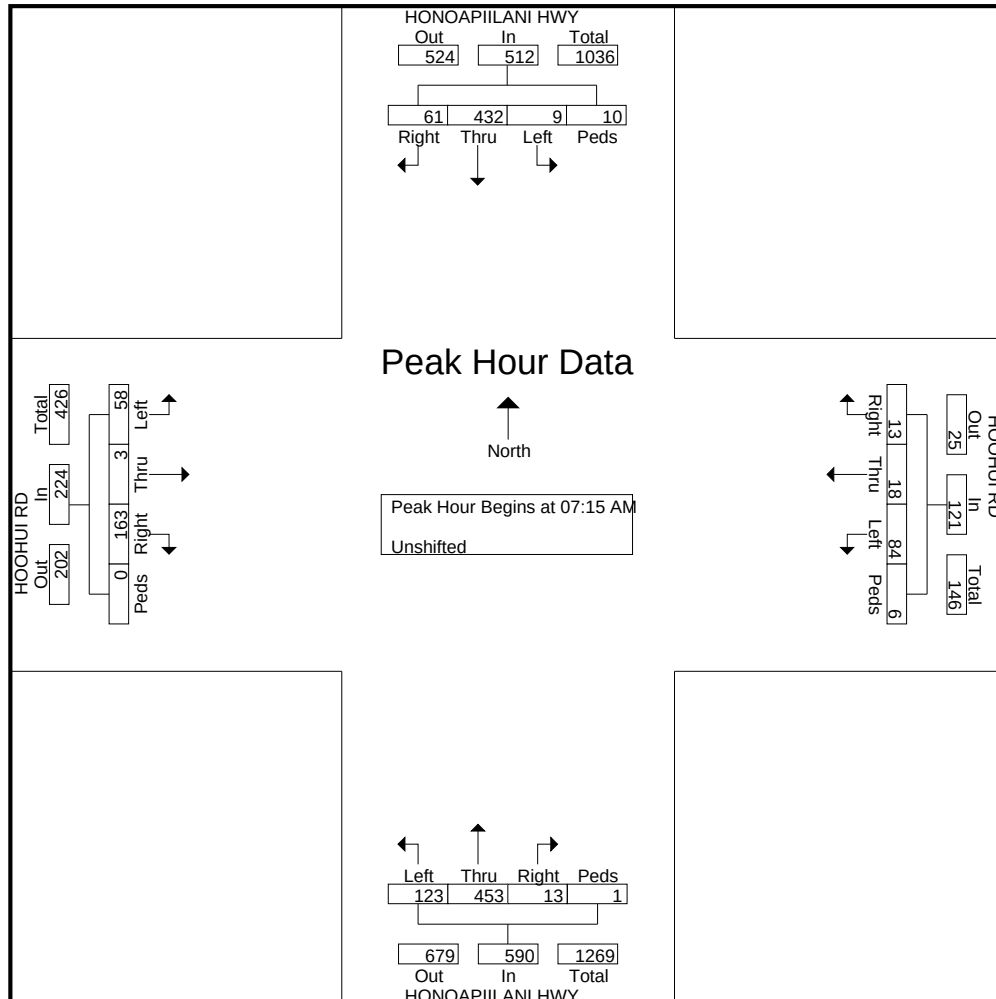
File Name : AM\_Honoapiilani Hwy - Hoohui Rd

Site Code : 00000000

Start Date : 12/1/2016

Page No : 2

|                                                                   | HONOAPIILANI HWY<br>Southbound |      |       |      |            | HOOHUI RD<br>Westbound |      |       |      |            | HONOAPIILANI HWY<br>Northbound |      |       |      |            | HOOHUI RD<br>Eastbound |      |       |      |            |            |
|-------------------------------------------------------------------|--------------------------------|------|-------|------|------------|------------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|------------------------|------|-------|------|------------|------------|
| Start Time                                                        | Left                           | Thru | Right | Peds | App. Total | Left                   | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Left                   | Thru | Right | Peds | App. Total | Int. Total |
| <b>Peak Hour Analysis From 06:15 AM to 08:00 AM - Peak 1 of 1</b> |                                |      |       |      |            |                        |      |       |      |            |                                |      |       |      |            |                        |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 07:15 AM              |                                |      |       |      |            |                        |      |       |      |            |                                |      |       |      |            |                        |      |       |      |            |            |
| 07:15 AM                                                          | 1                              | 113  | 19    | 2    | 135        | 36                     | 6    | 2     | 1    | 45         | 23                             | 89   | 1     | 1    | 114        | 11                     | 0    | 36    | 0    | 47         | 341        |
| 07:30 AM                                                          | 1                              | 89   | 19    | 5    | 114        | 18                     | 3    | 4     | 3    | 28         | 24                             | 110  | 3     | 0    | 137        | 15                     | 1    | 54    | 0    | 70         | 349        |
| 07:45 AM                                                          | 6                              | 111  | 10    | 2    | 129        | 16                     | 6    | 3     | 2    | 27         | 37                             | 117  | 5     | 0    | 159        | 19                     | 2    | 41    | 0    | 62         | 377        |
| 08:00 AM                                                          | 1                              | 119  | 13    | 1    | 134        | 14                     | 3    | 4     | 0    | 21         | 39                             | 137  | 4     | 0    | 180        | 13                     | 0    | 32    | 0    | 45         | 380        |
| Total Volume                                                      | 9                              | 432  | 61    | 10   | 512        | 84                     | 18   | 13    | 6    | 121        | 123                            | 453  | 13    | 1    | 590        | 58                     | 3    | 163   | 0    | 224        | 1447       |
| % App. Total                                                      | 1.8                            | 84.4 | 11.9  | 2    |            | 69.4                   | 14.9 | 10.7  | 5    |            | 20.8                           | 76.8 | 2.2   | 0.2  |            | 25.9                   | 1.3  | 72.8  | 0    |            |            |
| PHF                                                               | .375                           | .908 | .803  | .500 | .948       | .583                   | .750 | .813  | .500 | .672       | .788                           | .827 | .650  | .250 | .819       | .763                   | .375 | .755  | .000 | .800       | .952       |





# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : AM\_Honoapiilani Hwy - Akahele St

Site Code : 00000000

Start Date : 12/7/2016

Page No : 1

**Groups Printed- Unshifted - Bank 1**

[illegible]

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

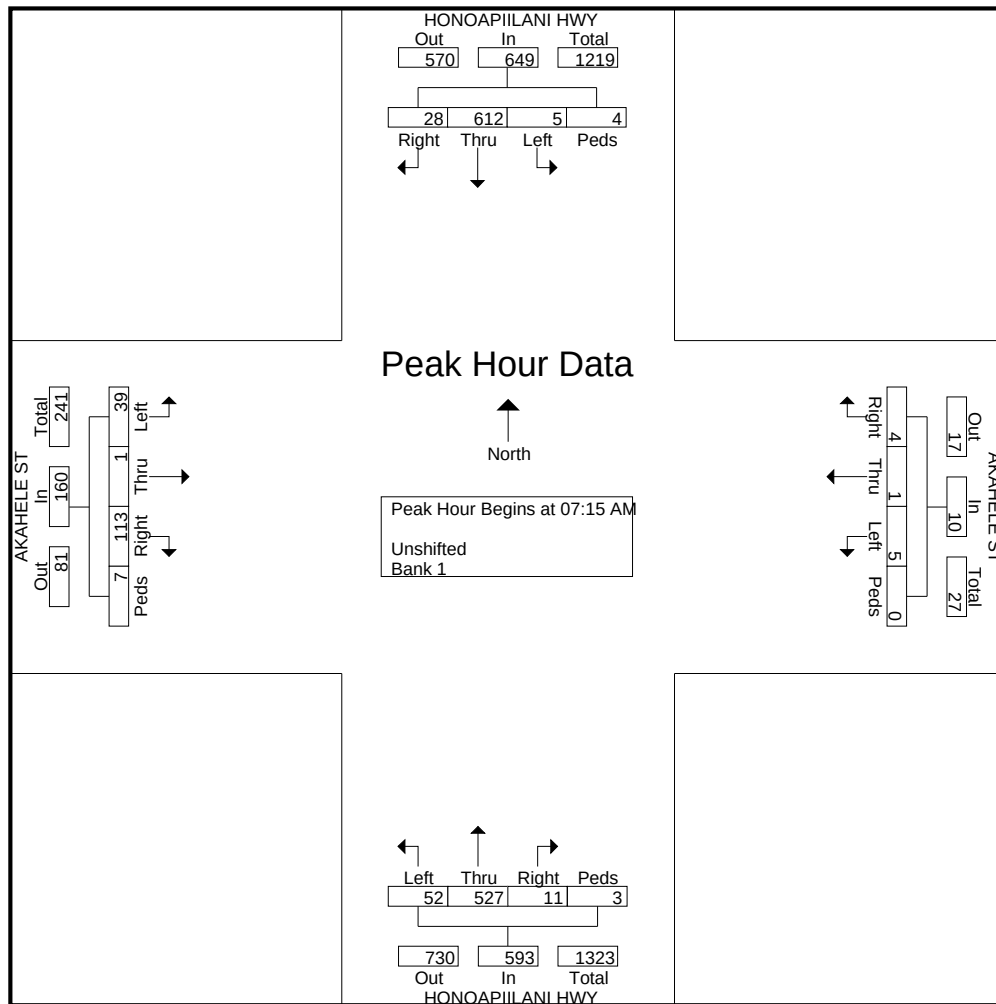
File Name : AM\_Honoapiilani Hwy - Akahele St

Site Code : 00000000

Start Date : 12/7/2016

Page No : 2

|                                                            | HONOAPIILANI HWY<br>Southbound |      |       |      |            | AKAHELE ST<br>Westbound |      |       |      |            | HONOAPIILANI HWY<br>Northbound |      |       |      |            | AKAHELE ST<br>Eastbound |      |       |      |            |            |
|------------------------------------------------------------|--------------------------------|------|-------|------|------------|-------------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|-------------------------|------|-------|------|------------|------------|
| Start Time                                                 | Left                           | Thru | Right | Peds | App. Total | Left                    | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Left                    | Thru | Right | Peds | App. Total | Int. Total |
| Peak Hour Analysis From 06:15 AM to 08:15 AM - Peak 1 of 1 |                                |      |       |      |            |                         |      |       |      |            |                                |      |       |      |            |                         |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 07:15 AM       |                                |      |       |      |            |                         |      |       |      |            |                                |      |       |      |            |                         |      |       |      |            |            |
| 07:15 AM                                                   | 1                              | 185  | 4     | 2    | 192        | 2                       | 0    | 2     | 0    | 4          | 10                             | 104  | 3     | 0    | 117        | 5                       | 0    | 46    | 3    | 54         | 367        |
| 07:30 AM                                                   | 3                              | 162  | 7     | 0    | 172        | 1                       | 0    | 1     | 0    | 2          | 12                             | 113  | 1     | 1    | 127        | 10                      | 0    | 30    | 1    | 41         | 342        |
| 07:45 AM                                                   | 0                              | 136  | 10    | 2    | 148        | 1                       | 1    | 1     | 0    | 3          | 19                             | 134  | 4     | 2    | 159        | 12                      | 1    | 23    | 1    | 37         | 347        |
| 08:00 AM                                                   | 1                              | 129  | 7     | 0    | 137        | 1                       | 0    | 0     | 0    | 1          | 11                             | 176  | 3     | 0    | 190        | 12                      | 0    | 14    | 2    | 28         | 356        |
| Total Volume                                               | 5                              | 612  | 28    | 4    | 649        | 5                       | 1    | 4     | 0    | 10         | 52                             | 527  | 11    | 3    | 593        | 39                      | 1    | 113   | 7    | 160        | 1412       |
| % App. Total                                               | 0.8                            | 94.3 | 4.3   | 0.6  |            | 50                      | 10   | 40    | 0    |            | 8.8                            | 88.9 | 1.9   | 0.5  |            | 24.4                    | 0.6  | 70.6  | 4.4  |            |            |
| PHF                                                        | .417                           | .827 | .700  | .500 | .845       | .625                    | .250 | .500  | .000 | .625       | .684                           | .749 | .688  | .375 | .780       | .813                    | .250 | .614  | .583 | .741       | .962       |



# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : AM\_Honoapiilani Hwy - Lower Honoapiilani Rd

Site Code : 00000000

Start Date : 12/7/2016

Page No : 1

Groups Printed- Unshifted

|             | HONOAPIILANI HWY<br>Southbound |      |       |      | LOWER HONOAPIILANI R<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |      | LOWER HONOAPIILANI R<br>Eastbound |      |       |      |            |
|-------------|--------------------------------|------|-------|------|-----------------------------------|------|-------|------|--------------------------------|------|-------|------|-----------------------------------|------|-------|------|------------|
| Start Time  | Left                           | Thru | Right | Peds | Left                              | Thru | Right | Peds | Left                           | Thru | Right | Peds | Left                              | Thru | Right | Peds | Int. Total |
| 06:30 AM    | 6                              | 97   | 3     | 0    | 14                                | 0    | 0     | 0    | 46                             | 85   | 33    | 0    | 6                                 | 0    | 57    | 0    | 347        |
| 06:45 AM    | 2                              | 150  | 0     | 0    | 5                                 | 0    | 3     | 0    | 41                             | 77   | 29    | 0    | 10                                | 3    | 96    | 0    | 416        |
| Total       | 8                              | 247  | 3     | 0    | 19                                | 0    | 3     | 0    | 87                             | 162  | 62    | 0    | 16                                | 3    | 153   | 0    | 763        |
| 07:00 AM    | 0                              | 177  | 0     | 0    | 4                                 | 0    | 0     | 0    | 64                             | 92   | 18    | 0    | 13                                | 4    | 89    | 0    | 461        |
| 07:15 AM    | 3                              | 199  | 0     | 0    | 1                                 | 0    | 0     | 0    | 59                             | 105  | 12    | 0    | 8                                 | 2    | 116   | 0    | 505        |
| 07:30 AM    | 3                              | 178  | 10    | 1    | 6                                 | 0    | 0     | 0    | 90                             | 135  | 14    | 0    | 6                                 | 2    | 112   | 0    | 557        |
| 07:45 AM    | 1                              | 145  | 0     | 1    | 2                                 | 1    | 0     | 0    | 73                             | 181  | 5     | 0    | 11                                | 2    | 94    | 0    | 516        |
| Total       | 7                              | 699  | 10    | 2    | 13                                | 1    | 0     | 0    | 286                            | 513  | 49    | 0    | 38                                | 10   | 411   | 0    | 2039       |
| 08:00 AM    | 1                              | 169  | 0     | 0    | 8                                 | 2    | 0     | 0    | 65                             | 171  | 7     | 0    | 5                                 | 1    | 111   | 0    | 540        |
| 08:15 AM    | 1                              | 117  | 0     | 0    | 4                                 | 2    | 2     | 0    | 81                             | 123  | 7     | 0    | 10                                | 0    | 105   | 0    | 452        |
| Grand Total | 17                             | 1232 | 13    | 2    | 44                                | 5    | 5     | 0    | 519                            | 969  | 125   | 0    | 69                                | 14   | 780   | 0    | 3794       |
| Apprch %    | 1.3                            | 97.5 | 1     | 0.2  | 81.5                              | 9.3  | 9.3   | 0    | 32.2                           | 60.1 | 7.7   | 0    | 8                                 | 1.6  | 90.4  | 0    |            |
| Total %     | 0.4                            | 32.5 | 0.3   | 0.1  | 1.2                               | 0.1  | 0.1   | 0    | 13.7                           | 25.5 | 3.3   | 0    | 1.8                               | 0.4  | 20.6  | 0    |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

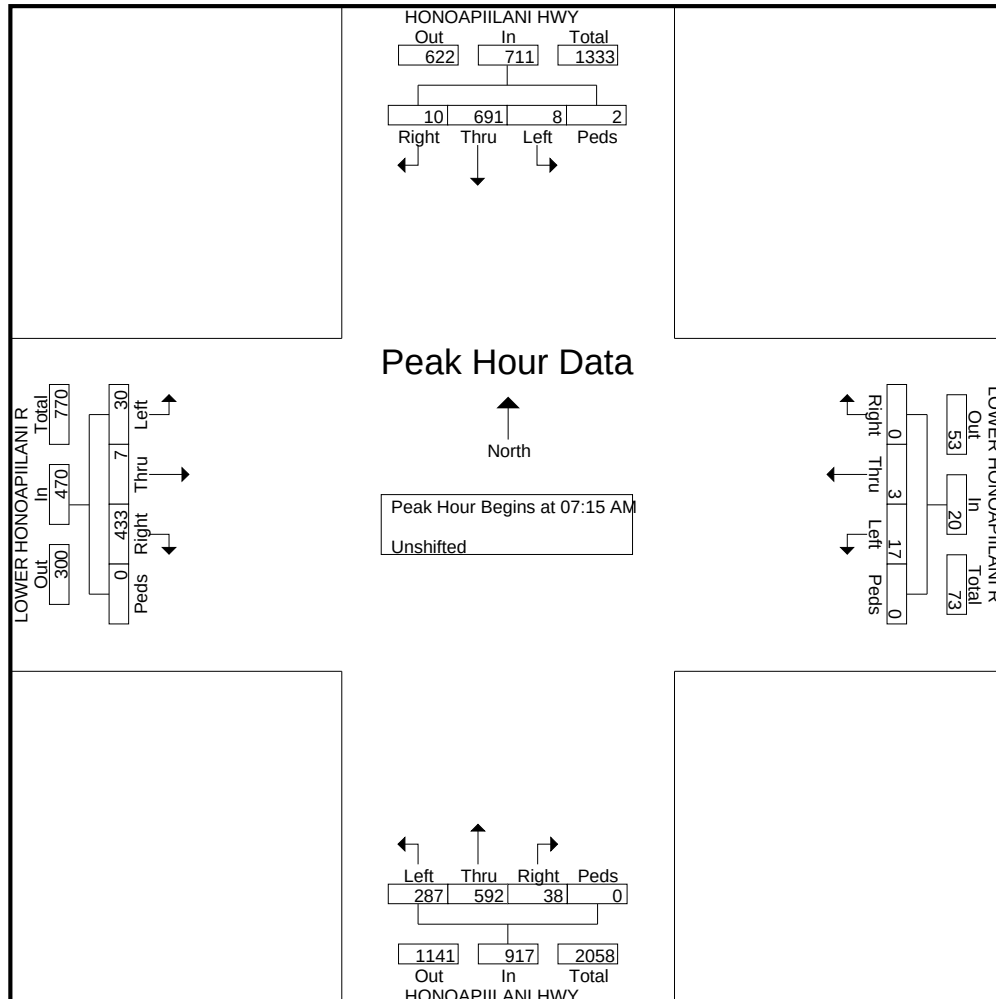
File Name : AM\_Honoapiilani Hwy - Lower Honoapiilani Rd

Site Code : 00000000

Start Date : 12/7/2016

Page No : 2

|                                                                   | HONOAPIILANI HWY<br>Southbound |      |       |      |            | LOWER HONOAPIILANI R<br>Westbound |      |       |      |            | HONOAPIILANI HWY<br>Northbound |      |       |      |            | LOWER HONOAPIILANI R<br>Eastbound |      |       |      |            |            |
|-------------------------------------------------------------------|--------------------------------|------|-------|------|------------|-----------------------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|-----------------------------------|------|-------|------|------------|------------|
| Start Time                                                        | Left                           | Thru | Right | Peds | App. Total | Left                              | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Left                              | Thru | Right | Peds | App. Total | Int. Total |
| <b>Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1</b> |                                |      |       |      |            |                                   |      |       |      |            |                                |      |       |      |            |                                   |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 07:15 AM              |                                |      |       |      |            |                                   |      |       |      |            |                                |      |       |      |            |                                   |      |       |      |            |            |
| 07:15 AM                                                          | 3                              | 199  | 0     | 0    | 202        | 1                                 | 0    | 0     | 0    | 1          | 59                             | 105  | 12    | 0    | 176        | 8                                 | 2    | 116   | 0    | 126        | 505        |
| 07:30 AM                                                          | 3                              | 178  | 10    | 1    | 192        | 6                                 | 0    | 0     | 0    | 6          | 90                             | 135  | 14    | 0    | 239        | 6                                 | 2    | 112   | 0    | 120        | 557        |
| 07:45 AM                                                          | 1                              | 145  | 0     | 1    | 147        | 2                                 | 1    | 0     | 0    | 3          | 73                             | 181  | 5     | 0    | 259        | 11                                | 2    | 94    | 0    | 107        | 516        |
| 08:00 AM                                                          | 1                              | 169  | 0     | 0    | 170        | 8                                 | 2    | 0     | 0    | 10         | 65                             | 171  | 7     | 0    | 243        | 5                                 | 1    | 111   | 0    | 117        | 540        |
| Total Volume                                                      | 8                              | 691  | 10    | 2    | 711        | 17                                | 3    | 0     | 0    | 20         | 287                            | 592  | 38    | 0    | 917        | 30                                | 7    | 433   | 0    | 470        | 2118       |
| % App. Total                                                      | 1.1                            | 97.2 | 1.4   | 0.3  |            | 85                                | 15   | 0     | 0    |            | 31.3                           | 64.6 | 4.1   | 0    |            | 6.4                               | 1.5  | 92.1  | 0    |            |            |
| PHF                                                               | .667                           | .868 | .250  | .500 | .880       | .531                              | .375 | .000  | .000 | .500       | .797                           | .818 | .679  | .000 | .885       | .682                              | .875 | .933  | .000 | .933       | .951       |



# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : AM\_Honoapiilani Hwy - Halawai Dr

Site Code : 00000000

Start Date : 12/7/2016

Page No : 1

## Groups Printed- Unshifted

|             | HONOAPIILANI HWY<br>Southbound |      |       |      | HALAWAI DR<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |      | HALAWAI DR<br>Eastbound |      |       |      |            |
|-------------|--------------------------------|------|-------|------|-------------------------|------|-------|------|--------------------------------|------|-------|------|-------------------------|------|-------|------|------------|
| Start Time  | Left                           | Thru | Right | Peds | Left                    | Thru | Right | Peds | Left                           | Thru | Right | Peds | Left                    | Thru | Right | Peds | Int. Total |
| 06:15 AM    | 0                              | 130  | 11    | 0    | 0                       | 0    | 0     | 0    | 14                             | 123  | 3     | 1    | 12                      | 0    | 2     | 0    | 296        |
| 06:30 AM    | 1                              | 151  | 15    | 0    | 1                       | 0    | 0     | 0    | 13                             | 159  | 4     | 0    | 13                      | 0    | 7     | 0    | 364        |
| 06:45 AM    | 1                              | 243  | 12    | 0    | 0                       | 0    | 1     | 0    | 16                             | 138  | 3     | 0    | 9                       | 0    | 6     | 0    | 429        |
| Total       | 2                              | 524  | 38    | 0    | 1                       | 0    | 1     | 0    | 43                             | 420  | 10    | 1    | 34                      | 0    | 15    | 0    | 1089       |
| 07:00 AM    | 0                              | 261  | 5     | 0    | 2                       | 1    | 3     | 0    | 20                             | 163  | 4     | 0    | 2                       | 0    | 4     | 0    | 465        |
| 07:15 AM    | 1                              | 330  | 11    | 0    | 2                       | 1    | 1     | 0    | 16                             | 190  | 2     | 0    | 6                       | 0    | 6     | 0    | 566        |
| 07:30 AM    | 3                              | 298  | 13    | 0    | 2                       | 0    | 0     | 0    | 13                             | 223  | 3     | 0    | 2                       | 0    | 14    | 0    | 571        |
| 07:45 AM    | 4                              | 248  | 4     | 0    | 4                       | 0    | 3     | 0    | 19                             | 289  | 6     | 0    | 5                       | 0    | 6     | 0    | 588        |
| Total       | 8                              | 1137 | 33    | 0    | 10                      | 2    | 7     | 0    | 68                             | 865  | 15    | 0    | 15                      | 0    | 30    | 0    | 2190       |
| 08:00 AM    | 6                              | 253  | 10    | 0    | 0                       | 0    | 2     | 0    | 16                             | 272  | 5     | 0    | 3                       | 0    | 7     | 0    | 574        |
| Grand Total | 16                             | 1914 | 81    | 0    | 11                      | 2    | 10    | 0    | 127                            | 1557 | 30    | 1    | 52                      | 0    | 52    | 0    | 3853       |
| Apprch %    | 0.8                            | 95.2 | 4     | 0    | 47.8                    | 8.7  | 43.5  | 0    | 7.4                            | 90.8 | 1.7   | 0.1  | 50                      | 0    | 50    | 0    |            |
| Total %     | 0.4                            | 49.7 | 2.1   | 0    | 0.3                     | 0.1  | 0.3   | 0    | 3.3                            | 40.4 | 0.8   | 0    | 1.3                     | 0    | 1.3   | 0    |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

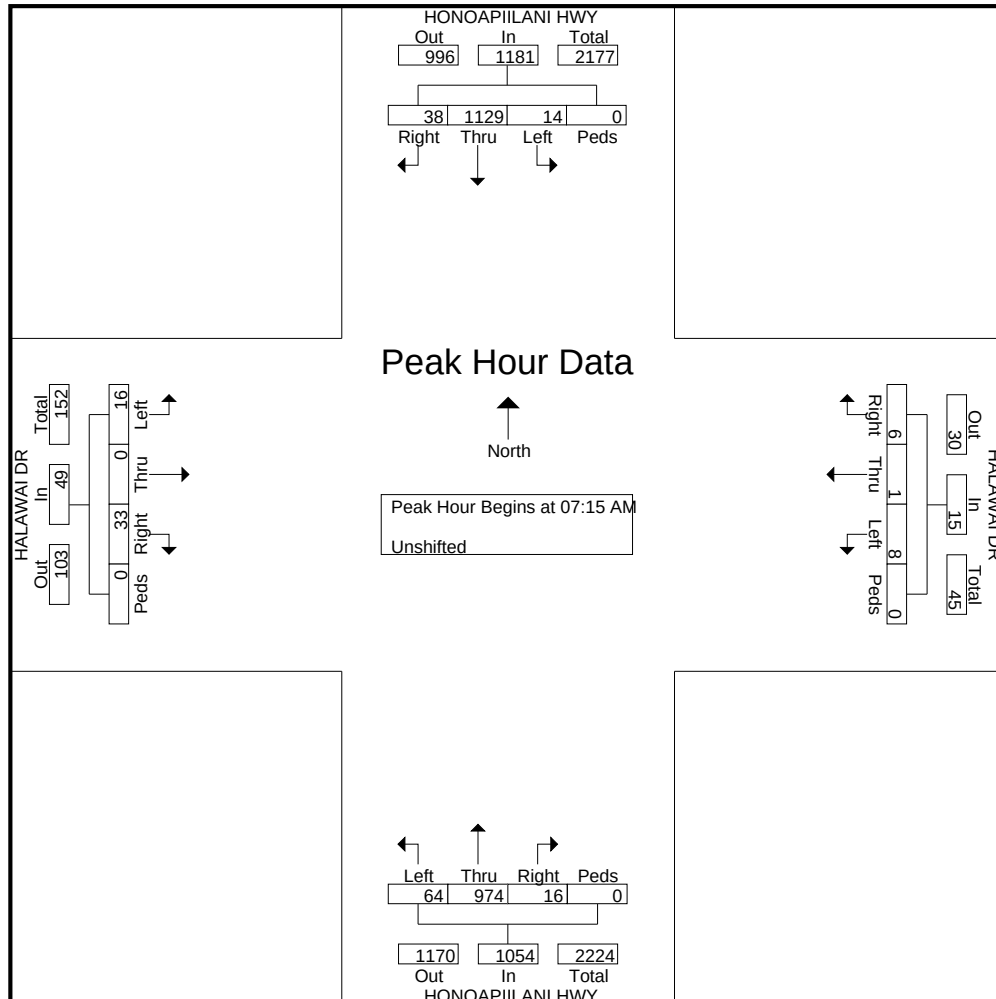
File Name : AM\_Honoapiilani Hwy - Halawai Dr

Site Code : 00000000

Start Date : 12/7/2016

Page No : 2

|                                                                   | HONOAPIILANI HWY<br>Southbound |      |       |      |            | HALAWAI DR<br>Westbound |      |       |      |            | HONOAPIILANI HWY<br>Northbound |      |       |      |            | HALAWAI DR<br>Eastbound |      |       |      |            |            |
|-------------------------------------------------------------------|--------------------------------|------|-------|------|------------|-------------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|-------------------------|------|-------|------|------------|------------|
| Start Time                                                        | Left                           | Thru | Right | Peds | App. Total | Left                    | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Left                    | Thru | Right | Peds | App. Total | Int. Total |
| <b>Peak Hour Analysis From 06:15 AM to 08:00 AM - Peak 1 of 1</b> |                                |      |       |      |            |                         |      |       |      |            |                                |      |       |      |            |                         |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 07:15 AM              |                                |      |       |      |            |                         |      |       |      |            |                                |      |       |      |            |                         |      |       |      |            |            |
| 07:15 AM                                                          | 1                              | 330  | 11    | 0    | 342        | 2                       | 1    | 1     | 0    | 4          | 16                             | 190  | 2     | 0    | 208        | 6                       | 0    | 6     | 0    | 12         | 566        |
| 07:30 AM                                                          | 3                              | 298  | 13    | 0    | 314        | 2                       | 0    | 0     | 0    | 2          | 13                             | 223  | 3     | 0    | 239        | 2                       | 0    | 14    | 0    | 16         | 571        |
| 07:45 AM                                                          | 4                              | 248  | 4     | 0    | 256        | 4                       | 0    | 3     | 0    | 7          | 19                             | 289  | 6     | 0    | 314        | 5                       | 0    | 6     | 0    | 11         | 588        |
| 08:00 AM                                                          | 6                              | 253  | 10    | 0    | 269        | 0                       | 0    | 2     | 0    | 2          | 16                             | 272  | 5     | 0    | 293        | 3                       | 0    | 7     | 0    | 10         | 574        |
| Total Volume                                                      | 14                             | 1129 | 38    | 0    | 1181       | 8                       | 1    | 6     | 0    | 15         | 64                             | 974  | 16    | 0    | 1054       | 16                      | 0    | 33    | 0    | 49         | 2299       |
| % App. Total                                                      | 1.2                            | 95.6 | 3.2   | 0    |            | 53.3                    | 6.7  | 40    | 0    |            | 6.1                            | 92.4 | 1.5   | 0    |            | 32.7                    | 0    | 67.3  | 0    |            |            |
| PHF                                                               | .583                           | .855 | .731  | .000 | .863       | .500                    | .250 | .500  | .000 | .536       | .842                           | .843 | .667  | .000 | .839       | .667                    | .000 | .589  | .000 | .766       | .977       |



# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : AM\_Honoapiilani Hwy - Puukolii Rd

Site Code : 00000000

Start Date : 12/7/2016

Page No : 1

## Groups Printed- Unshifted

|             | HONOAPIILANI HWY<br>Southbound |      |       |      | PUUKOLII RD<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |      | PUUKOLII RD<br>Eastbound |      |       |      |            |
|-------------|--------------------------------|------|-------|------|--------------------------|------|-------|------|--------------------------------|------|-------|------|--------------------------|------|-------|------|------------|
| Start Time  | Left                           | Thru | Right | Peds | Left                     | Thru | Right | Peds | Left                           | Thru | Right | Peds | Left                     | Thru | Right | Peds | Int. Total |
| 06:15 AM    | 1                              | 118  | 5     | 2    | 1                        | 0    | 3     | 0    | 12                             | 140  | 3     | 0    | 3                        | 0    | 12    | 0    | 300        |
| 06:30 AM    | 1                              | 142  | 9     | 1    | 5                        | 1    | 7     | 0    | 13                             | 154  | 3     | 0    | 6                        | 0    | 13    | 0    | 355        |
| 06:45 AM    | 1                              | 228  | 12    | 3    | 6                        | 0    | 4     | 0    | 19                             | 140  | 8     | 0    | 4                        | 0    | 8     | 0    | 433        |
| Total       | 3                              | 488  | 26    | 6    | 12                       | 1    | 14    | 0    | 44                             | 434  | 14    | 0    | 13                       | 0    | 33    | 0    | 1088       |
| 07:00 AM    | 2                              | 254  | 5     | 0    | 2                        | 0    | 3     | 0    | 5                              | 119  | 3     | 0    | 8                        | 0    | 1     | 0    | 402        |
| 07:15 AM    | 6                              | 305  | 6     | 0    | 10                       | 0    | 3     | 0    | 22                             | 209  | 12    | 0    | 6                        | 0    | 7     | 0    | 586        |
| 07:30 AM    | 1                              | 293  | 12    | 0    | 9                        | 6    | 8     | 0    | 31                             | 235  | 10    | 0    | 12                       | 1    | 6     | 0    | 624        |
| 07:45 AM    | 7                              | 239  | 12    | 1    | 12                       | 5    | 21    | 0    | 19                             | 258  | 17    | 0    | 16                       | 1    | 7     | 0    | 615        |
| Total       | 16                             | 1091 | 35    | 1    | 33                       | 11   | 35    | 0    | 77                             | 821  | 42    | 0    | 42                       | 2    | 21    | 0    | 2227       |
| 08:00 AM    | 10                             | 223  | 7     | 0    | 8                        | 2    | 9     | 0    | 30                             | 263  | 15    | 0    | 11                       | 2    | 10    | 0    | 590        |
| Grand Total | 29                             | 1802 | 68    | 7    | 53                       | 14   | 58    | 0    | 151                            | 1518 | 71    | 0    | 66                       | 4    | 64    | 0    | 3905       |
| Apprch %    | 1.5                            | 94.5 | 3.6   | 0.4  | 42.4                     | 11.2 | 46.4  | 0    | 8.7                            | 87.2 | 4.1   | 0    | 49.3                     | 3    | 47.8  | 0    |            |
| Total %     | 0.7                            | 46.1 | 1.7   | 0.2  | 1.4                      | 0.4  | 1.5   | 0    | 3.9                            | 38.9 | 1.8   | 0    | 1.7                      | 0.1  | 1.6   | 0    |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

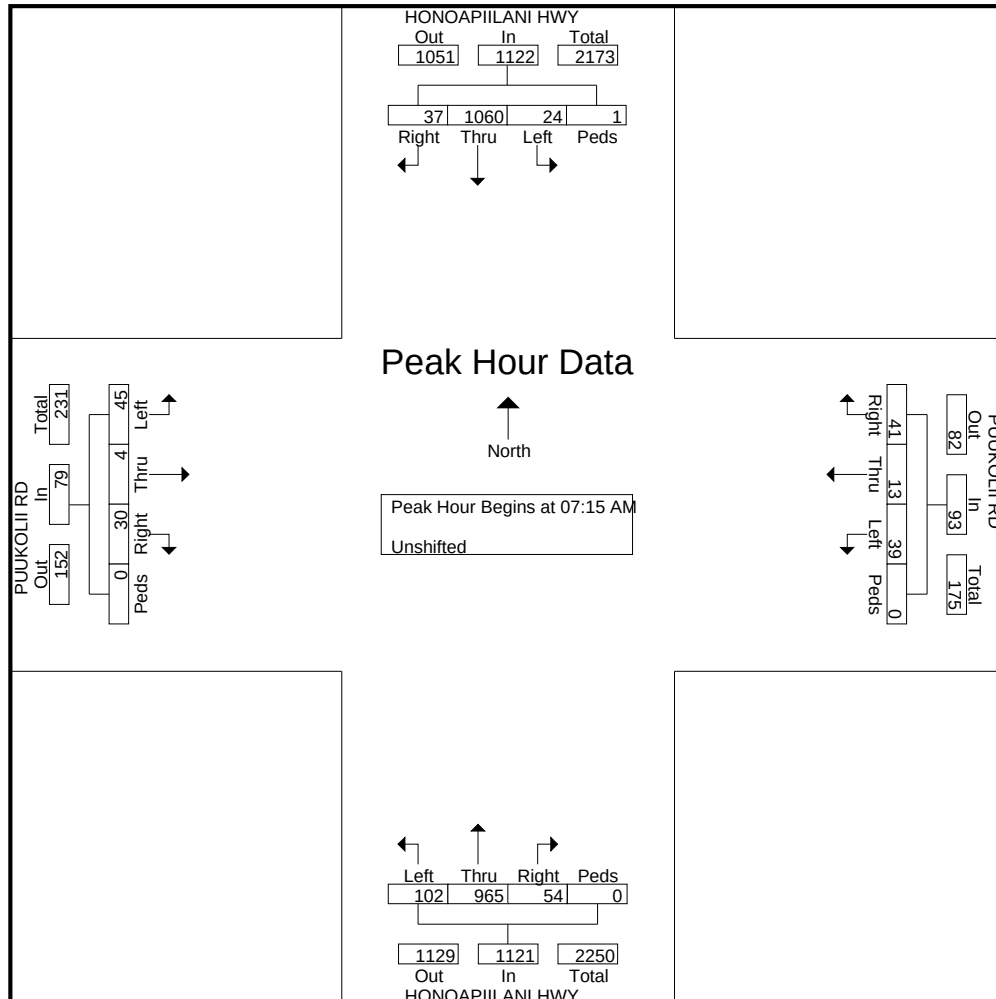
File Name : AM\_Honoapiilani Hwy - Puukolii Rd

Site Code : 00000000

Start Date : 12/7/2016

Page No : 2

|                                                                   | HONOAPIILANI HWY<br>Southbound |            |           |          |            | PUUKOLII RD<br>Westbound |          |           |      |            | HONOAPIILANI HWY<br>Northbound |            |           |      |            | PUUKOLII RD<br>Eastbound |          |           |      |            |            |
|-------------------------------------------------------------------|--------------------------------|------------|-----------|----------|------------|--------------------------|----------|-----------|------|------------|--------------------------------|------------|-----------|------|------------|--------------------------|----------|-----------|------|------------|------------|
| Start Time                                                        | Left                           | Thru       | Right     | Peds     | App. Total | Left                     | Thru     | Right     | Peds | App. Total | Left                           | Thru       | Right     | Peds | App. Total | Left                     | Thru     | Right     | Peds | App. Total | Int. Total |
| <b>Peak Hour Analysis From 06:15 AM to 08:00 AM - Peak 1 of 1</b> |                                |            |           |          |            |                          |          |           |      |            |                                |            |           |      |            |                          |          |           |      |            |            |
| Peak Hour for Entire Intersection Begins at 07:15 AM              |                                |            |           |          |            |                          |          |           |      |            |                                |            |           |      |            |                          |          |           |      |            |            |
| 07:15 AM                                                          | 6                              | <b>305</b> | 6         | 0        | <b>317</b> | 10                       | 0        | 3         | 0    | 13         | 22                             | 209        | 12        | 0    | 243        | 6                        | 0        | 7         | 0    | 13         | 586        |
| 07:30 AM                                                          | 1                              | 293        | <b>12</b> | 0        | 306        | 9                        | <b>6</b> | 8         | 0    | 23         | <b>31</b>                      | 235        | 10        | 0    | 276        | 12                       | 1        | 6         | 0    | 19         | <b>624</b> |
| 07:45 AM                                                          | 7                              | 239        | 12        | <b>1</b> | 259        | <b>12</b>                | 5        | <b>21</b> | 0    | <b>38</b>  | 19                             | 258        | <b>17</b> | 0    | 294        | <b>16</b>                | 1        | 7         | 0    | <b>24</b>  | 615        |
| 08:00 AM                                                          | <b>10</b>                      | 223        | 7         | 0        | 240        | 8                        | 2        | 9         | 0    | 19         | 30                             | <b>263</b> | 15        | 0    | <b>308</b> | 11                       | <b>2</b> | <b>10</b> | 0    | 23         | 590        |
| Total Volume                                                      | 24                             | 1060       | 37        | 1        | 1122       | 39                       | 13       | 41        | 0    | 93         | 102                            | 965        | 54        | 0    | 1121       | 45                       | 4        | 30        | 0    | 79         | 2415       |
| % App. Total                                                      | 2.1                            | 94.5       | 3.3       | 0.1      |            | 41.9                     | 14       | 44.1      | 0    |            | 9.1                            | 86.1       | 4.8       | 0    |            | 57                       | 5.1      | 38        | 0    |            |            |
| PHF                                                               | .600                           | .869       | .771      | .250     | .885       | .813                     | .542     | .488      | .000 | .612       | .823                           | .917       | .794      | .000 | .910       | .703                     | .500     | .750      | .000 | .823       | .968       |





# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : AM\_Honoapiilani Hwy - Kaanapali Pkwy

Site Code : 00000000

Start Date : 12/7/2016

Page No : 1

## Groups Printed- Unshifted

|             | HONOAPIILANI HWY<br>Southbound |      |       |      | KAANAPALI PKWY<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |      | KAANAPALI PKWY<br>Eastbound |      |       |      |            |
|-------------|--------------------------------|------|-------|------|-----------------------------|------|-------|------|--------------------------------|------|-------|------|-----------------------------|------|-------|------|------------|
| Start Time  | Left                           | Thru | Right | Peds | Left                        | Thru | Right | Peds | Left                           | Thru | Right | Peds | Left                        | Thru | Right | Peds | Int. Total |
| 06:15 AM    | 5                              | 114  | 9     | 0    | 0                           | 1    | 0     | 0    | 50                             | 142  | 4     | 0    | 13                          | 0    | 22    | 0    | 360        |
| 06:30 AM    | 3                              | 134  | 13    | 0    | 3                           | 0    | 2     | 0    | 77                             | 180  | 2     | 0    | 11                          | 0    | 41    | 0    | 466        |
| 06:45 AM    | 9                              | 183  | 26    | 2    | 4                           | 8    | 1     | 0    | 81                             | 186  | 2     | 0    | 17                          | 1    | 42    | 0    | 562        |
| Total       | 17                             | 431  | 48    | 2    | 7                           | 9    | 3     | 0    | 208                            | 508  | 8     | 0    | 41                          | 1    | 105   | 0    | 1388       |
| 07:00 AM    | 8                              | 251  | 11    | 0    | 2                           | 3    | 1     | 0    | 79                             | 163  | 0     | 0    | 20                          | 2    | 52    | 1    | 593        |
| 07:15 AM    | 17                             | 264  | 20    | 0    | 2                           | 3    | 1     | 0    | 93                             | 218  | 3     | 0    | 18                          | 1    | 51    | 0    | 691        |
| 07:30 AM    | 4                              | 290  | 30    | 2    | 2                           | 3    | 3     | 0    | 113                            | 264  | 2     | 0    | 34                          | 0    | 54    | 2    | 803        |
| 07:45 AM    | 9                              | 232  | 21    | 1    | 3                           | 2    | 3     | 0    | 120                            | 319  | 5     | 0    | 28                          | 0    | 49    | 2    | 794        |
| Total       | 38                             | 1037 | 82    | 3    | 9                           | 11   | 8     | 0    | 405                            | 964  | 10    | 0    | 100                         | 3    | 206   | 5    | 2881       |
| 08:00 AM    | 10                             | 210  | 16    | 2    | 3                           | 2    | 1     | 0    | 84                             | 270  | 4     | 0    | 35                          | 5    | 60    | 2    | 704        |
| Grand Total | 65                             | 1678 | 146   | 7    | 19                          | 22   | 12    | 0    | 697                            | 1742 | 22    | 0    | 176                         | 9    | 371   | 7    | 4973       |
| Apprch %    | 3.4                            | 88.5 | 7.7   | 0.4  | 35.8                        | 41.5 | 22.6  | 0    | 28.3                           | 70.8 | 0.9   | 0    | 31.3                        | 1.6  | 65.9  | 1.2  |            |
| Total %     | 1.3                            | 33.7 | 2.9   | 0.1  | 0.4                         | 0.4  | 0.2   | 0    | 14                             | 35   | 0.4   | 0    | 3.5                         | 0.2  | 7.5   | 0.1  |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

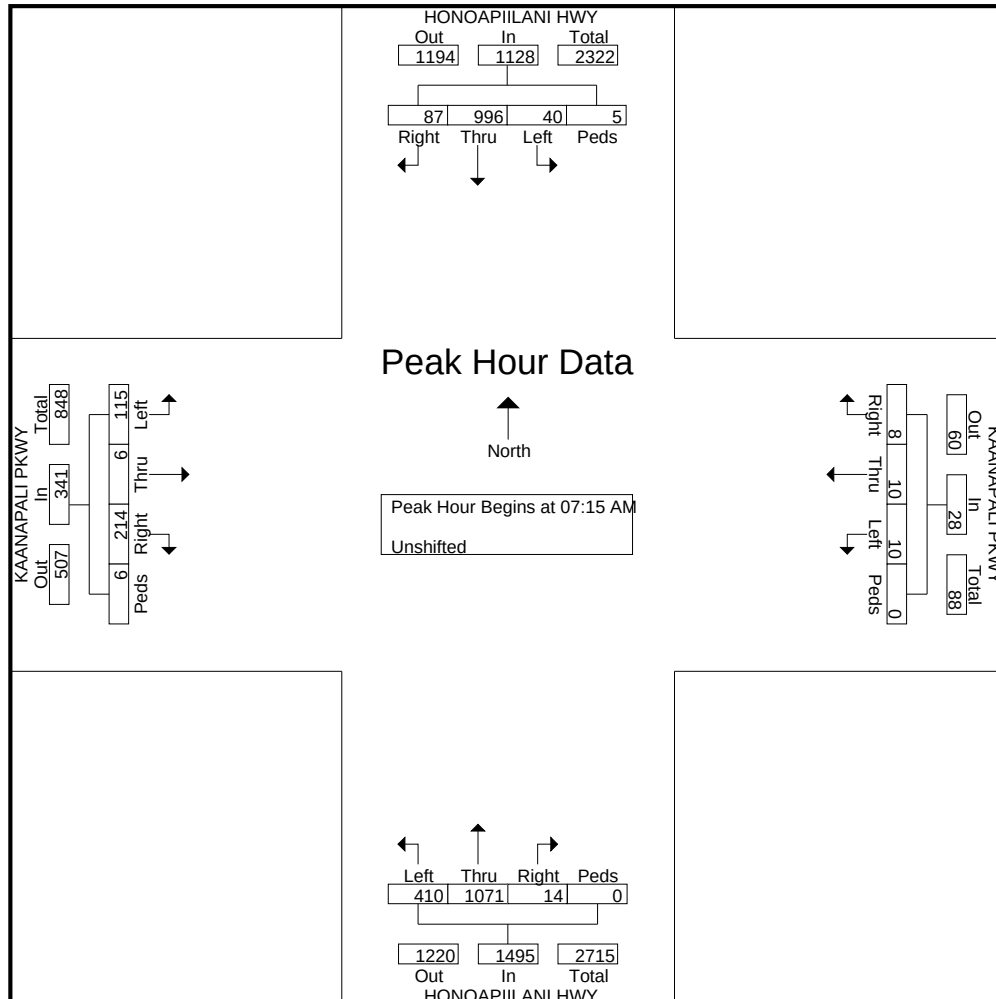
File Name : AM\_Honoapiilani Hwy - Kaanapali Pkwy

Site Code : 00000000

Start Date : 12/7/2016

Page No : 2

|                                                                   | HONOAPIILANI HWY<br>Southbound |      |       |      |            | KAANAPALI PKWY<br>Westbound |      |       |      |            | HONOAPIILANI HWY<br>Northbound |      |       |      |            | KAANAPALI PKWY<br>Eastbound |      |       |      |            |            |
|-------------------------------------------------------------------|--------------------------------|------|-------|------|------------|-----------------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|-----------------------------|------|-------|------|------------|------------|
| Start Time                                                        | Left                           | Thru | Right | Peds | App. Total | Left                        | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Left                        | Thru | Right | Peds | App. Total | Int. Total |
| <b>Peak Hour Analysis From 06:15 AM to 08:00 AM - Peak 1 of 1</b> |                                |      |       |      |            |                             |      |       |      |            |                                |      |       |      |            |                             |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 07:15 AM              |                                |      |       |      |            |                             |      |       |      |            |                                |      |       |      |            |                             |      |       |      |            |            |
| 07:15 AM                                                          | 17                             | 264  | 20    | 0    | 301        | 2                           | 3    | 1     | 0    | 6          | 93                             | 218  | 3     | 0    | 314        | 18                          | 1    | 51    | 0    | 70         | 691        |
| 07:30 AM                                                          | 4                              | 290  | 30    | 2    | 326        | 2                           | 3    | 3     | 0    | 8          | 113                            | 264  | 2     | 0    | 379        | 34                          | 0    | 54    | 2    | 90         | 803        |
| 07:45 AM                                                          | 9                              | 232  | 21    | 1    | 263        | 3                           | 2    | 3     | 0    | 8          | 120                            | 319  | 5     | 0    | 444        | 28                          | 0    | 49    | 2    | 79         | 794        |
| 08:00 AM                                                          | 10                             | 210  | 16    | 2    | 238        | 3                           | 2    | 1     | 0    | 6          | 84                             | 270  | 4     | 0    | 358        | 35                          | 5    | 60    | 2    | 102        | 704        |
| Total Volume                                                      | 40                             | 996  | 87    | 5    | 1128       | 10                          | 10   | 8     | 0    | 28         | 410                            | 1071 | 14    | 0    | 1495       | 115                         | 6    | 214   | 6    | 341        | 2992       |
| % App. Total                                                      | 3.5                            | 88.3 | 7.7   | 0.4  |            | 35.7                        | 35.7 | 28.6  | 0    |            | 27.4                           | 71.6 | 0.9   | 0    |            | 33.7                        | 1.8  | 62.8  | 1.8  |            |            |
| PHF                                                               | .588                           | .859 | .725  | .625 | .865       | .833                        | .833 | .667  | .000 | .875       | .854                           | .839 | .700  | .000 | .842       | .821                        | .300 | .892  | .750 | .836       | .932       |



# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : AM\_Honoapiilani Hwy - Leialii Pkwy

Site Code : 00000000

Start Date : 12/7/2016

Page No : 1

## Groups Printed- Unshifted

|             | HONOAPIILANI HWY<br>Southbound |      |       |      | LEIALII PKWY<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |      | LEIALII PKWY<br>Eastbound |      |       |      |            |
|-------------|--------------------------------|------|-------|------|---------------------------|------|-------|------|--------------------------------|------|-------|------|---------------------------|------|-------|------|------------|
| Start Time  | Left                           | Thru | Right | Peds | Left                      | Thru | Right | Peds | Left                           | Thru | Right | Peds | Left                      | Thru | Right | Peds | Int. Total |
| 06:15 AM    | 3                              | 134  | 0     | 2    | 10                        | 0    | 1     | 0    | 0                              | 217  | 3     | 0    | 0                         | 0    | 0     | 0    | 370        |
| 06:30 AM    | 2                              | 173  | 1     | 2    | 9                         | 0    | 9     | 1    | 0                              | 254  | 7     | 0    | 0                         | 0    | 0     | 0    | 458        |
| 06:45 AM    | 3                              | 201  | 0     | 1    | 11                        | 1    | 11    | 0    | 2                              | 245  | 11    | 0    | 0                         | 0    | 2     | 0    | 488        |
| Total       | 8                              | 508  | 1     | 5    | 30                        | 1    | 21    | 1    | 2                              | 716  | 21    | 0    | 0                         | 0    | 2     | 0    | 1316       |
| 07:00 AM    | 6                              | 320  | 0     | 0    | 16                        | 0    | 5     | 2    | 1                              | 264  | 14    | 0    | 0                         | 0    | 0     | 2    | 630        |
| 07:15 AM    | 5                              | 325  | 1     | 0    | 16                        | 0    | 7     | 1    | 0                              | 333  | 15    | 0    | 1                         | 0    | 0     | 0    | 704        |
| 07:30 AM    | 4                              | 342  | 1     | 1    | 9                         | 0    | 9     | 1    | 0                              | 442  | 22    | 0    | 0                         | 0    | 2     | 2    | 835        |
| 07:45 AM    | 7                              | 272  | 2     | 4    | 16                        | 0    | 8     | 2    | 2                              | 375  | 23    | 0    | 1                         | 1    | 1     | 3    | 717        |
| Total       | 22                             | 1259 | 4     | 5    | 57                        | 0    | 29    | 6    | 3                              | 1414 | 74    | 0    | 2                         | 1    | 3     | 7    | 2886       |
| 08:00 AM    | 9                              | 251  | 0     | 2    | 15                        | 0    | 15    | 0    | 1                              | 335  | 26    | 0    | 0                         | 0    | 1     | 1    | 656        |
| 08:15 AM    | 6                              | 284  | 0     | 1    | 15                        | 0    | 12    | 5    | 0                              | 312  | 21    | 0    | 0                         | 0    | 0     | 1    | 657        |
| Grand Total | 45                             | 2302 | 5     | 13   | 117                       | 1    | 77    | 12   | 6                              | 2777 | 142   | 0    | 2                         | 1    | 6     | 9    | 5515       |
| Apprch %    | 1.9                            | 97.3 | 0.2   | 0.5  | 56.5                      | 0.5  | 37.2  | 5.8  | 0.2                            | 94.9 | 4.9   | 0    | 11.1                      | 5.6  | 33.3  | 50   |            |
| Total %     | 0.8                            | 41.7 | 0.1   | 0.2  | 2.1                       | 0    | 1.4   | 0.2  | 0.1                            | 50.4 | 2.6   | 0    | 0                         | 0    | 0.1   | 0.2  |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

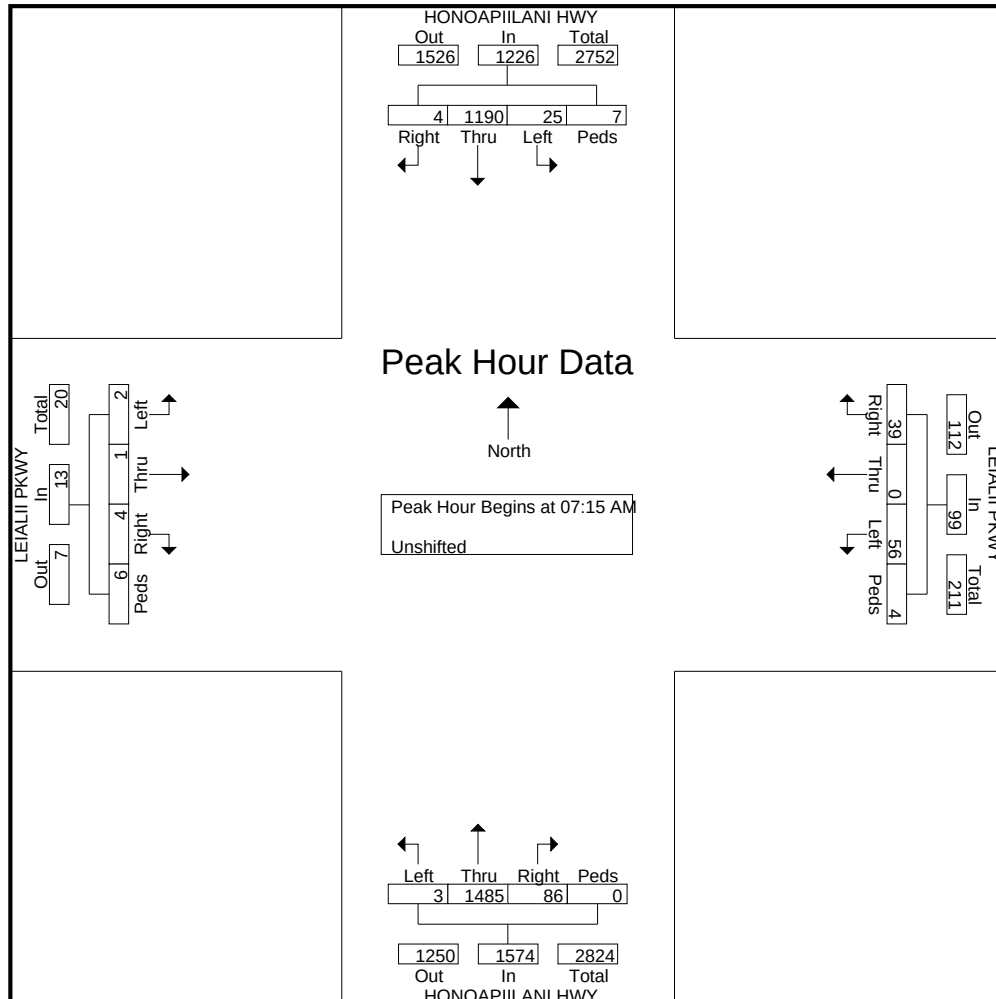
File Name : AM\_Honoapiilani Hwy - Leialii Pkwy

Site Code : 00000000

Start Date : 12/7/2016

Page No : 2

|                                                                   | HONOAPIILANI HWY<br>Southbound |            |          |          |            | LEIALII PKWY<br>Westbound |      |           |          |            | HONOAPIILANI HWY<br>Northbound |            |           |      |            | LEIALII PKWY<br>Eastbound |          |          |          |            |            |
|-------------------------------------------------------------------|--------------------------------|------------|----------|----------|------------|---------------------------|------|-----------|----------|------------|--------------------------------|------------|-----------|------|------------|---------------------------|----------|----------|----------|------------|------------|
| Start Time                                                        | Left                           | Thru       | Right    | Peds     | App. Total | Left                      | Thru | Right     | Peds     | App. Total | Left                           | Thru       | Right     | Peds | App. Total | Left                      | Thru     | Right    | Peds     | App. Total | Int. Total |
| <b>Peak Hour Analysis From 06:15 AM to 08:15 AM - Peak 1 of 1</b> |                                |            |          |          |            |                           |      |           |          |            |                                |            |           |      |            |                           |          |          |          |            |            |
| Peak Hour for Entire Intersection Begins at 07:15 AM              |                                |            |          |          |            |                           |      |           |          |            |                                |            |           |      |            |                           |          |          |          |            |            |
| 07:15 AM                                                          | 5                              | 325        | 1        | 0        | 331        | 16                        | 0    | 7         | 1        | 24         | 0                              | 333        | 15        | 0    | 348        | 1                         | 0        | 0        | 0        | 1          | 704        |
| 07:30 AM                                                          | 4                              | <b>342</b> | 1        | 1        | <b>348</b> | 9                         | 0    | 9         | 1        | 19         | 0                              | <b>442</b> | 22        | 0    | <b>464</b> | 0                         | 0        | <b>2</b> | 2        | 4          | <b>835</b> |
| 07:45 AM                                                          | 7                              | 272        | <b>2</b> | <b>4</b> | 285        | 16                        | 0    | 8         | <b>2</b> | 26         | <b>2</b>                       | 375        | 23        | 0    | 400        | 1                         | <b>1</b> | 1        | <b>3</b> | <b>6</b>   | 717        |
| 08:00 AM                                                          | <b>9</b>                       | 251        | 0        | 2        | 262        | 15                        | 0    | <b>15</b> | 0        | <b>30</b>  | 1                              | 335        | <b>26</b> | 0    | 362        | 0                         | 0        | 1        | 1        | 2          | 656        |
| Total Volume                                                      | 25                             | 1190       | 4        | 7        | 1226       | 56                        | 0    | 39        | 4        | 99         | 3                              | 1485       | 86        | 0    | 1574       | 2                         | 1        | 4        | 6        | 13         | 2912       |
| % App. Total                                                      | 2                              | 97.1       | 0.3      | 0.6      |            | 56.6                      | 0    | 39.4      | 4        |            | 0.2                            | 94.3       | 5.5       | 0    |            | 15.4                      | 7.7      | 30.8     | 46.2     |            |            |
| PHF                                                               | .694                           | .870       | .500     | .438     | .881       | .875                      | .000 | .650      | .500     | .825       | .375                           | .840       | .827      | .000 | .848       | .500                      | .250     | .500     | .500     | .542       | .872       |



# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : AM\_Honoapiilani Hwy - Front St

Site Code : 00000000

Start Date : 12/7/2016

Page No : 1

## Groups Printed- Unshifted

|             | HONOAPIILANI HWY<br>Southbound |      |       |      | FLEMING RD<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |      | FRONT ST<br>Eastbound |      |       |      |            |
|-------------|--------------------------------|------|-------|------|-------------------------|------|-------|------|--------------------------------|------|-------|------|-----------------------|------|-------|------|------------|
| Start Time  | Left                           | Thru | Right | Peds | Left                    | Thru | Right | Peds | Left                           | Thru | Right | Peds | Left                  | Thru | Right | Peds | Int. Total |
| 06:15 AM    | 0                              | 126  | 9     | 0    | 12                      | 1    | 2     | 0    | 0                              | 208  | 0     | 0    | 2                     | 0    | 0     | 3    | 363        |
| 06:30 AM    | 0                              | 155  | 12    | 0    | 13                      | 2    | 0     | 0    | 1                              | 213  | 3     | 0    | 7                     | 1    | 0     | 0    | 407        |
| 06:45 AM    | 0                              | 183  | 13    | 0    | 15                      | 1    | 1     | 0    | 0                              | 234  | 1     | 0    | 6                     | 0    | 1     | 0    | 455        |
| Total       | 0                              | 464  | 34    | 0    | 40                      | 4    | 3     | 0    | 1                              | 655  | 4     | 0    | 15                    | 1    | 1     | 3    | 1225       |
| 07:00 AM    | 0                              | 240  | 31    | 0    | 44                      | 4    | 3     | 0    | 0                              | 238  | 3     | 0    | 5                     | 0    | 0     | 0    | 568        |
| 07:15 AM    | 1                              | 280  | 53    | 0    | 29                      | 7    | 2     | 0    | 0                              | 327  | 2     | 0    | 18                    | 0    | 1     | 1    | 721        |
| 07:30 AM    | 1                              | 298  | 58    | 0    | 35                      | 2    | 7     | 0    | 1                              | 422  | 3     | 0    | 20                    | 1    | 1     | 0    | 849        |
| 07:45 AM    | 0                              | 249  | 32    | 0    | 16                      | 1    | 2     | 0    | 0                              | 389  | 8     | 0    | 24                    | 1    | 0     | 0    | 722        |
| Total       | 2                              | 1067 | 174   | 0    | 124                     | 14   | 14    | 0    | 1                              | 1376 | 16    | 0    | 67                    | 2    | 2     | 1    | 2860       |
| 08:00 AM    | 4                              | 232  | 24    | 0    | 21                      | 5    | 2     | 0    | 1                              | 333  | 3     | 0    | 19                    | 2    | 1     | 1    | 648        |
| Grand Total | 6                              | 1763 | 232   | 0    | 185                     | 23   | 19    | 0    | 3                              | 2364 | 23    | 0    | 101                   | 5    | 4     | 5    | 4733       |
| Apprch %    | 0.3                            | 88.1 | 11.6  | 0    | 81.5                    | 10.1 | 8.4   | 0    | 0.1                            | 98.9 | 1     | 0    | 87.8                  | 4.3  | 3.5   | 4.3  |            |
| Total %     | 0.1                            | 37.2 | 4.9   | 0    | 3.9                     | 0.5  | 0.4   | 0    | 0.1                            | 49.9 | 0.5   | 0    | 2.1                   | 0.1  | 0.1   | 0.1  |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

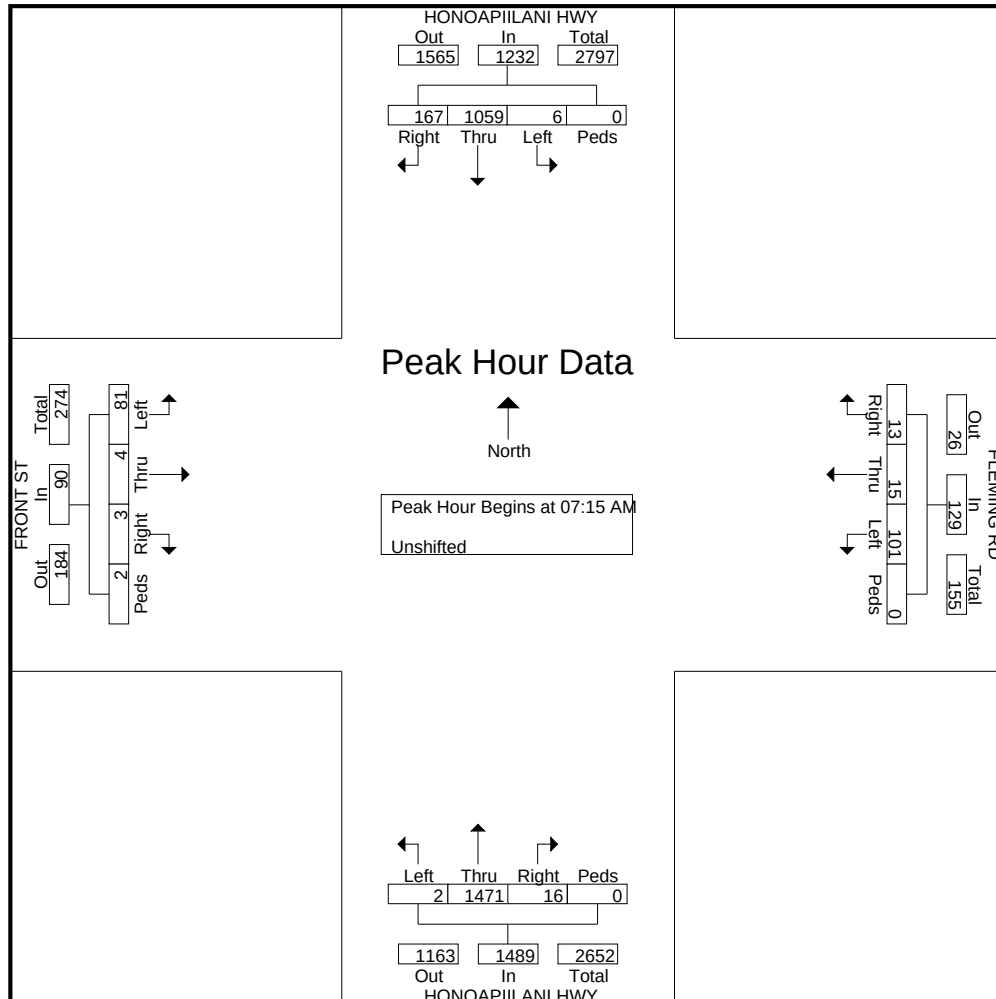
File Name : AM\_Honoapiilani Hwy - Front St

Site Code : 00000000

Start Date : 12/7/2016

Page No : 2

|                                                                   | HONOAPIILANI HWY<br>Southbound |            |           |      |            | FLEMING RD<br>Westbound |      |          |      |            | HONOAPIILANI HWY<br>Northbound |            |          |      |            | FRONT ST<br>Eastbound |          |       |      |            |            |
|-------------------------------------------------------------------|--------------------------------|------------|-----------|------|------------|-------------------------|------|----------|------|------------|--------------------------------|------------|----------|------|------------|-----------------------|----------|-------|------|------------|------------|
| Start Time                                                        | Left                           | Thru       | Right     | Peds | App. Total | Left                    | Thru | Right    | Peds | App. Total | Left                           | Thru       | Right    | Peds | App. Total | Left                  | Thru     | Right | Peds | App. Total | Int. Total |
| <b>Peak Hour Analysis From 06:15 AM to 08:00 AM - Peak 1 of 1</b> |                                |            |           |      |            |                         |      |          |      |            |                                |            |          |      |            |                       |          |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 07:15 AM              |                                |            |           |      |            |                         |      |          |      |            |                                |            |          |      |            |                       |          |       |      |            |            |
| 07:15 AM                                                          | 1                              | 280        | 53        | 0    | 334        | 29                      | 7    | 2        | 0    | 38         | 0                              | 327        | 2        | 0    | 329        | 18                    | 0        | 1     | 1    | 20         | 721        |
| 07:30 AM                                                          | 1                              | <b>298</b> | <b>58</b> | 0    | <b>357</b> | <b>35</b>               | 2    | <b>7</b> | 0    | <b>44</b>  | <b>1</b>                       | <b>422</b> | 3        | 0    | <b>426</b> | 20                    | 1        | 1     | 0    | 22         | <b>849</b> |
| 07:45 AM                                                          | 0                              | 249        | 32        | 0    | 281        | 16                      | 1    | 2        | 0    | 19         | 0                              | 389        | <b>8</b> | 0    | 397        | <b>24</b>             | 1        | 0     | 0    | <b>25</b>  | 722        |
| 08:00 AM                                                          | <b>4</b>                       | 232        | 24        | 0    | 260        | 21                      | 5    | 2        | 0    | 28         | 1                              | 333        | 3        | 0    | 337        | 19                    | <b>2</b> | 1     | 1    | 23         | 648        |
| Total Volume                                                      | 6                              | 1059       | 167       | 0    | 1232       | 101                     | 15   | 13       | 0    | 129        | 2                              | 1471       | 16       | 0    | 1489       | 81                    | 4        | 3     | 2    | 90         | 2940       |
| % App. Total                                                      | 0.5                            | 86         | 13.6      | 0    |            | 78.3                    | 11.6 | 10.1     | 0    |            | 0.1                            | 98.8       | 1.1      | 0    |            | 90                    | 4.4      | 3.3   | 2.2  |            |            |
| PHF                                                               | .375                           | .888       | .720      | .000 | .863       | .721                    | .536 | .464     | .000 | .733       | .500                           | .871       | .500     | .000 | .874       | .844                  | .500     | .750  | .500 | .900       | .866       |



# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : AM\_Honoapiilani Hwy-Kapunakea St

Site Code : 00000000

Start Date : 12/7/2016

Page No : 1

Groups Printed- Unshifted

|             | KAPUNAKEA ST<br>Eastbound |      |       |      | KAPUNAKEA ST<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |      | HONOAPIILANI HWY<br>Southbound |      |       |      |            |
|-------------|---------------------------|------|-------|------|---------------------------|------|-------|------|--------------------------------|------|-------|------|--------------------------------|------|-------|------|------------|
| Start Time  | Left                      | Thru | Right | Peds | Left                      | Thru | Right | Peds | Left                           | Thru | Right | Peds | Left                           | Thru | Right | Peds | Int. Total |
| 06:15 AM    | 8                         | 1    | 2     | 0    | 14                        | 1    | 7     | 0    | 1                              | 199  | 7     | 0    | 0                              | 132  | 6     | 1    | 379        |
| 06:30 AM    | 14                        | 1    | 4     | 0    | 16                        | 3    | 4     | 0    | 3                              | 243  | 11    | 0    | 0                              | 172  | 9     | 2    | 482        |
| 06:45 AM    | 14                        | 1    | 5     | 0    | 24                        | 5    | 5     | 0    | 6                              | 214  | 6     | 0    | 0                              | 199  | 14    | 1    | 494        |
| Total       | 36                        | 3    | 11    | 0    | 54                        | 9    | 16    | 0    | 10                             | 656  | 24    | 0    | 0                              | 503  | 29    | 4    | 1355       |
| 07:00 AM    | 17                        | 3    | 9     | 0    | 28                        | 7    | 5     | 1    | 5                              | 245  | 4     | 0    | 4                              | 304  | 13    | 4    | 649        |
| 07:15 AM    | 28                        | 6    | 4     | 0    | 51                        | 10   | 7     | 0    | 7                              | 296  | 16    | 0    | 3                              | 290  | 16    | 3    | 737        |
| 07:30 AM    | 21                        | 7    | 6     | 0    | 33                        | 5    | 14    | 0    | 3                              | 386  | 15    | 0    | 2                              | 336  | 17    | 4    | 849        |
| 07:45 AM    | 24                        | 9    | 6     | 0    | 30                        | 5    | 5     | 0    | 5                              | 375  | 26    | 0    | 0                              | 240  | 16    | 2    | 743        |
| Total       | 90                        | 25   | 25    | 0    | 142                       | 27   | 31    | 1    | 20                             | 1302 | 61    | 0    | 9                              | 1170 | 62    | 13   | 2978       |
| 08:00 AM    | 22                        | 5    | 3     | 0    | 27                        | 3    | 3     | 1    | 8                              | 296  | 14    | 0    | 2                              | 237  | 13    | 0    | 634        |
| Grand Total | 148                       | 33   | 39    | 0    | 223                       | 39   | 50    | 2    | 38                             | 2254 | 99    | 0    | 11                             | 1910 | 104   | 17   | 4967       |
| Apprch %    | 67.3                      | 15   | 17.7  | 0    | 71                        | 12.4 | 15.9  | 0.6  | 1.6                            | 94.3 | 4.1   | 0    | 0.5                            | 93.5 | 5.1   | 0.8  |            |
| Total %     | 3                         | 0.7  | 0.8   | 0    | 4.5                       | 0.8  | 1     | 0    | 0.8                            | 45.4 | 2     | 0    | 0.2                            | 38.5 | 2.1   | 0.3  |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

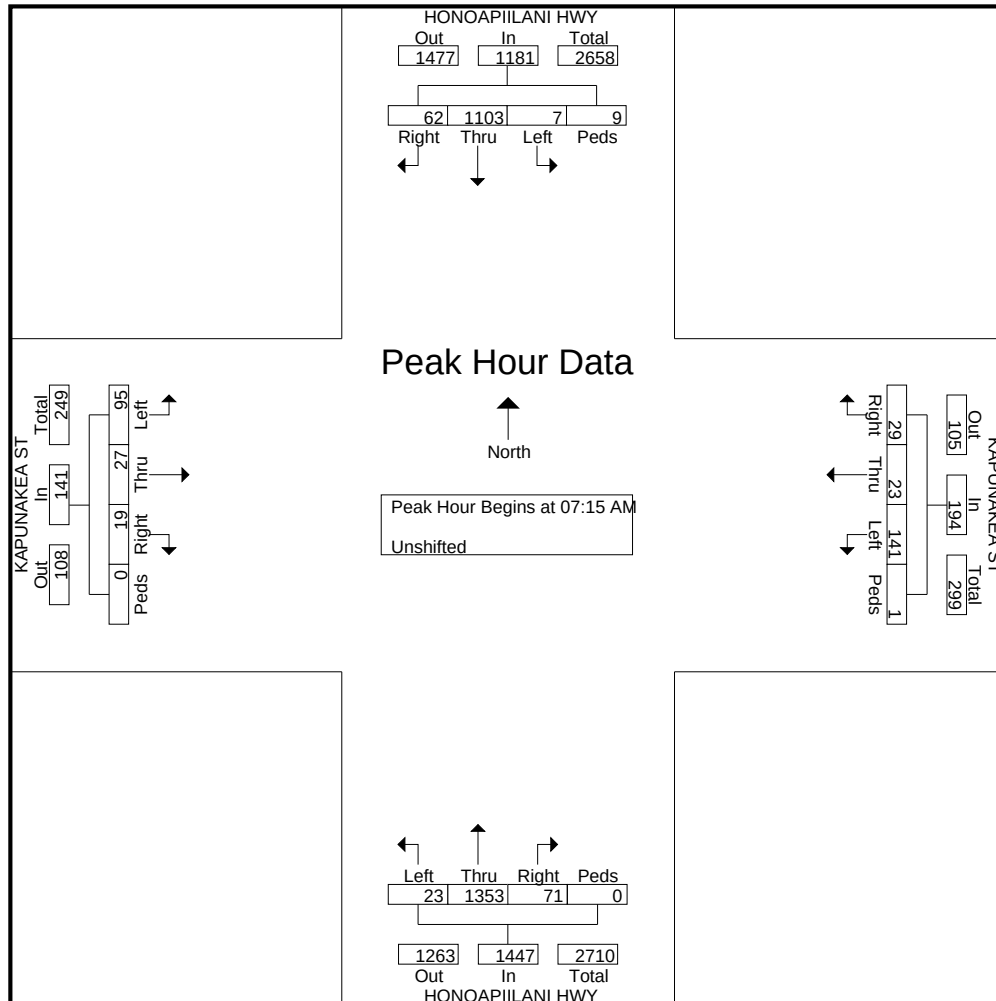
File Name : AM\_Honoapiilani Hwy-Kapunakea St

Site Code : 00000000

Start Date : 12/7/2016

Page No : 2

|                                                            | KAPUNAKEA ST<br>Eastbound |      |       |      |            | KAPUNAKEA ST<br>Westbound |      |       |      |            | HONOAPIILANI HWY<br>Northbound |      |       |      |            | HONOAPIILANI HWY<br>Southbound |      |       |      |            |            |
|------------------------------------------------------------|---------------------------|------|-------|------|------------|---------------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|------------|
| Start Time                                                 | Left                      | Thru | Right | Peds | App. Total | Left                      | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 |                           |      |       |      |            |                           |      |       |      |            |                                |      |       |      |            |                                |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 07:15 AM       |                           |      |       |      |            |                           |      |       |      |            |                                |      |       |      |            |                                |      |       |      |            |            |
| 07:15 AM                                                   | 28                        | 6    | 4     | 0    | 38         | 51                        | 10   | 7     | 0    | 68         | 7                              | 296  | 16    | 0    | 319        | 3                              | 290  | 16    | 3    | 312        | 737        |
| 07:30 AM                                                   | 21                        | 7    | 6     | 0    | 34         | 33                        | 5    | 14    | 0    | 52         | 3                              | 386  | 15    | 0    | 404        | 2                              | 336  | 17    | 4    | 359        | 849        |
| 07:45 AM                                                   | 24                        | 9    | 6     | 0    | 39         | 30                        | 5    | 5     | 0    | 40         | 5                              | 375  | 26    | 0    | 406        | 0                              | 240  | 16    | 2    | 258        | 743        |
| 08:00 AM                                                   | 22                        | 5    | 3     | 0    | 30         | 27                        | 3    | 3     | 1    | 34         | 8                              | 296  | 14    | 0    | 318        | 2                              | 237  | 13    | 0    | 252        | 634        |
| Total Volume                                               | 95                        | 27   | 19    | 0    | 141        | 141                       | 23   | 29    | 1    | 194        | 23                             | 1353 | 71    | 0    | 1447       | 7                              | 1103 | 62    | 9    | 1181       | 2963       |
| % App. Total                                               | 67.4                      | 19.1 | 13.5  | 0    |            | 72.7                      | 11.9 | 14.9  | 0.5  |            | 1.6                            | 93.5 | 4.9   | 0    |            | 0.6                            | 93.4 | 5.2   | 0.8  |            |            |
| PHF                                                        | .848                      | .750 | .792  | .000 | .904       | .691                      | .575 | .518  | .250 | .713       | .719                           | .876 | .683  | .000 | .891       | .583                           | .821 | .912  | .563 | .822       | .872       |





# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : AM\_Honoapiilani Hwy-Keawe St

Site Code : 00000000

Start Date : 12/7/2016

Page No : 1

Groups Printed- Unshifted

|             | KEAWE ST<br>Eastbound |      |       |      | KEAWE ST<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |      | HONOAPIILANI HWY<br>Southbound |      |       |      |            |
|-------------|-----------------------|------|-------|------|-----------------------|------|-------|------|--------------------------------|------|-------|------|--------------------------------|------|-------|------|------------|
| Start Time  | Left                  | Thru | Right | Peds | Left                  | Thru | Right | Peds | Left                           | Thru | Right | Peds | Left                           | Thru | Right | Peds | Int. Total |
| 06:15 AM    | 0                     | 2    | 1     | 0    | 17                    | 2    | 47    | 1    | 6                              | 149  | 19    | 0    | 24                             | 115  | 1     | 2    | 386        |
| 06:30 AM    | 2                     | 2    | 9     | 2    | 7                     | 5    | 56    | 1    | 2                              | 192  | 24    | 0    | 33                             | 146  | 3     | 0    | 484        |
| 06:45 AM    | 2                     | 10   | 6     | 0    | 13                    | 5    | 53    | 0    | 5                              | 169  | 25    | 0    | 52                             | 170  | 3     | 0    | 513        |
| Total       | 4                     | 14   | 16    | 2    | 37                    | 12   | 156   | 2    | 13                             | 510  | 68    | 0    | 109                            | 431  | 7     | 2    | 1383       |
| 07:00 AM    | 1                     | 12   | 6     | 2    | 20                    | 6    | 68    | 2    | 6                              | 191  | 36    | 2    | 84                             | 247  | 3     | 4    | 690        |
| 07:15 AM    | 4                     | 43   | 9     | 0    | 27                    | 11   | 114   | 0    | 5                              | 190  | 36    | 3    | 88                             | 229  | 9     | 0    | 768        |
| 07:30 AM    | 3                     | 21   | 9     | 0    | 28                    | 12   | 110   | 3    | 13                             | 288  | 46    | 2    | 74                             | 301  | 3     | 3    | 916        |
| 07:45 AM    | 5                     | 17   | 14    | 2    | 32                    | 23   | 130   | 0    | 6                              | 255  | 53    | 2    | 58                             | 210  | 3     | 3    | 813        |
| Total       | 13                    | 93   | 38    | 4    | 107                   | 52   | 422   | 5    | 30                             | 924  | 171   | 9    | 304                            | 987  | 18    | 10   | 3187       |
| 08:00 AM    | 1                     | 15   | 13    | 2    | 28                    | 14   | 76    | 1    | 12                             | 235  | 29    | 2    | 55                             | 200  | 2     | 0    | 685        |
| Grand Total | 18                    | 122  | 67    | 8    | 172                   | 78   | 654   | 8    | 55                             | 1669 | 268   | 11   | 468                            | 1618 | 27    | 12   | 5255       |
| Apprch %    | 8.4                   | 56.7 | 31.2  | 3.7  | 18.9                  | 8.6  | 71.7  | 0.9  | 2.7                            | 83.3 | 13.4  | 0.5  | 22                             | 76.1 | 1.3   | 0.6  |            |
| Total %     | 0.3                   | 2.3  | 1.3   | 0.2  | 3.3                   | 1.5  | 12.4  | 0.2  | 1                              | 31.8 | 5.1   | 0.2  | 8.9                            | 30.8 | 0.5   | 0.2  |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

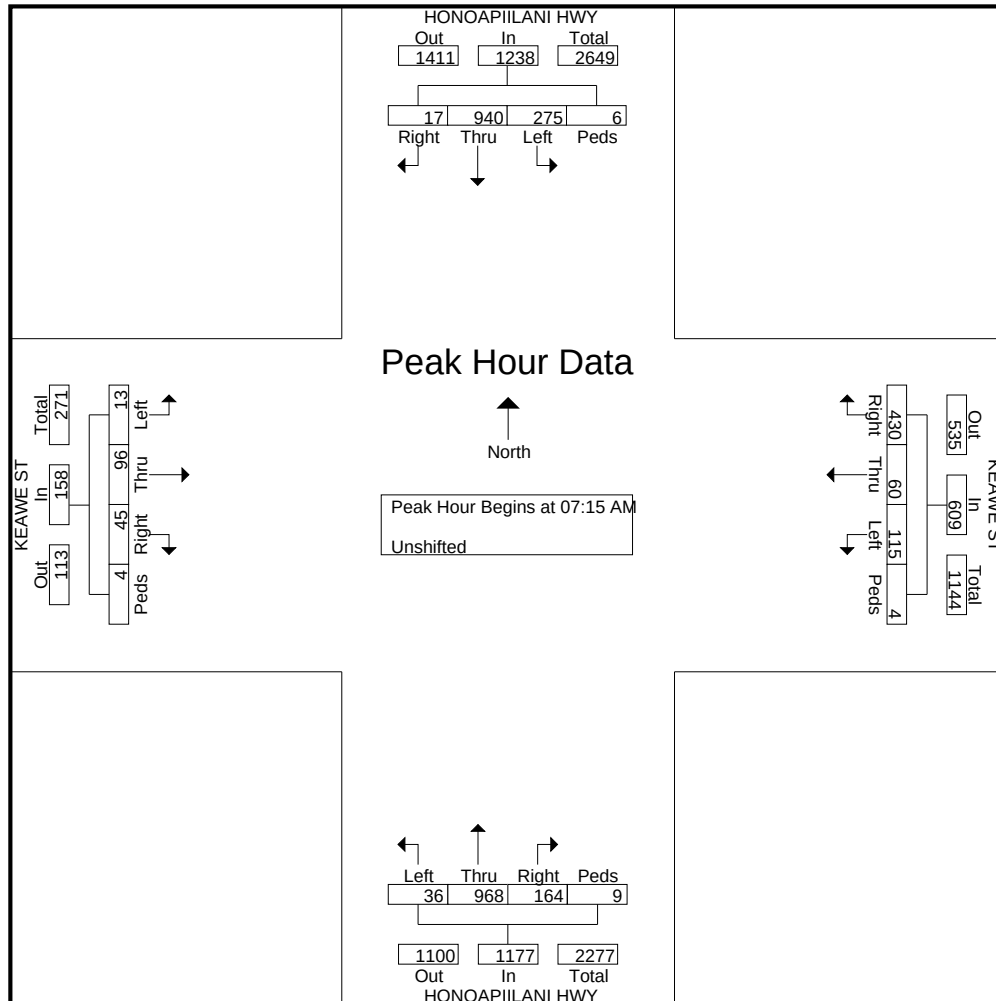
File Name : AM\_Honoapiilani Hwy-Keawe St

Site Code : 00000000

Start Date : 12/7/2016

Page No : 2

|                                                            | KEAWE ST<br>Eastbound |      |       |      |            | KEAWE ST<br>Westbound |      |       |      |            | HONOAPIILANI HWY<br>Northbound |      |       |      |            | HONOAPIILANI HWY<br>Southbound |      |       |      |            |            |
|------------------------------------------------------------|-----------------------|------|-------|------|------------|-----------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|------------|
| Start Time                                                 | Left                  | Thru | Right | Peds | App. Total | Left                  | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 |                       |      |       |      |            |                       |      |       |      |            |                                |      |       |      |            |                                |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 07:15 AM       |                       |      |       |      |            |                       |      |       |      |            |                                |      |       |      |            |                                |      |       |      |            |            |
| 07:15 AM                                                   | 4                     | 43   | 9     | 0    | 56         | 27                    | 11   | 114   | 0    | 152        | 5                              | 190  | 36    | 3    | 234        | 88                             | 229  | 9     | 0    | 326        | 768        |
| 07:30 AM                                                   | 3                     | 21   | 9     | 0    | 33         | 28                    | 12   | 110   | 3    | 153        | 13                             | 288  | 46    | 2    | 349        | 74                             | 301  | 3     | 3    | 381        | 916        |
| 07:45 AM                                                   | 5                     | 17   | 14    | 2    | 38         | 32                    | 23   | 130   | 0    | 185        | 6                              | 255  | 53    | 2    | 316        | 58                             | 210  | 3     | 3    | 274        | 813        |
| 08:00 AM                                                   | 1                     | 15   | 13    | 2    | 31         | 28                    | 14   | 76    | 1    | 119        | 12                             | 235  | 29    | 2    | 278        | 55                             | 200  | 2     | 0    | 257        | 685        |
| Total Volume                                               | 13                    | 96   | 45    | 4    | 158        | 115                   | 60   | 430   | 4    | 609        | 36                             | 968  | 164   | 9    | 1177       | 275                            | 940  | 17    | 6    | 1238       | 3182       |
| % App. Total                                               | 8.2                   | 60.8 | 28.5  | 2.5  |            | 18.9                  | 9.9  | 70.6  | 0.7  |            | 3.1                            | 82.2 | 13.9  | 0.8  |            | 22.2                           | 75.9 | 1.4   | 0.5  |            |            |
| PHF                                                        | .650                  | .558 | .804  | .500 | .705       | .898                  | .652 | .827  | .333 | .823       | .692                           | .840 | .774  | .750 | .843       | .781                           | .781 | .472  | .500 | .812       | .868       |



# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : PM\_Honoapiilani Hwy - Napilihau St

Site Code : 00000000

Start Date : 11/30/2016

Page No : 1

## Groups Printed- Unshifted

|             | HONOAPIILANI HWY<br>Southbound |      |       |      | NAPILIHOU ST<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |      | NAPILIHOU ST<br>Eastbound |      |       |      |            |
|-------------|--------------------------------|------|-------|------|---------------------------|------|-------|------|--------------------------------|------|-------|------|---------------------------|------|-------|------|------------|
| Start Time  | Left                           | Thru | Right | Peds | Left                      | Thru | Right | Peds | Left                           | Thru | Right | Peds | Left                      | Thru | Right | Peds | Int. Total |
| 03:00 PM    | 0                              | 72   | 8     | 0    | 9                         | 1    | 0     | 0    | 65                             | 60   | 6     | 0    | 11                        | 2    | 78    | 1    | 313        |
| 03:15 PM    | 1                              | 59   | 14    | 0    | 8                         | 1    | 0     | 0    | 75                             | 43   | 3     | 0    | 6                         | 0    | 54    | 0    | 264        |
| 03:30 PM    | 2                              | 59   | 10    | 1    | 6                         | 2    | 0     | 0    | 74                             | 62   | 3     | 0    | 20                        | 4    | 71    | 0    | 314        |
| 03:45 PM    | 0                              | 56   | 15    | 0    | 10                        | 5    | 2     | 0    | 69                             | 48   | 6     | 0    | 16                        | 3    | 85    | 0    | 315        |
| Total       | 3                              | 246  | 47    | 1    | 33                        | 9    | 2     | 0    | 283                            | 213  | 18    | 0    | 53                        | 9    | 288   | 1    | 1206       |
| 04:00 PM    | 0                              | 75   | 38    | 0    | 11                        | 4    | 0     | 0    | 83                             | 52   | 4     | 0    | 9                         | 1    | 96    | 0    | 373        |
| 04:15 PM    | 2                              | 68   | 6     | 0    | 7                         | 3    | 0     | 0    | 102                            | 58   | 9     | 0    | 13                        | 2    | 81    | 0    | 351        |
| 04:30 PM    | 0                              | 53   | 13    | 0    | 8                         | 2    | 1     | 0    | 98                             | 36   | 3     | 0    | 15                        | 2    | 83    | 0    | 314        |
| 04:45 PM    | 5                              | 48   | 24    | 0    | 10                        | 5    | 4     | 0    | 108                            | 53   | 5     | 0    | 18                        | 2    | 83    | 1    | 366        |
| Total       | 7                              | 244  | 81    | 0    | 36                        | 14   | 5     | 0    | 391                            | 199  | 21    | 0    | 55                        | 7    | 343   | 1    | 1404       |
| Grand Total | 10                             | 490  | 128   | 1    | 69                        | 23   | 7     | 0    | 674                            | 412  | 39    | 0    | 108                       | 16   | 631   | 2    | 2610       |
| Apprch %    | 1.6                            | 77.9 | 20.3  | 0.2  | 69.7                      | 23.2 | 7.1   | 0    | 59.9                           | 36.6 | 3.5   | 0    | 14.3                      | 2.1  | 83.4  | 0.3  |            |
| Total %     | 0.4                            | 18.8 | 4.9   | 0    | 2.6                       | 0.9  | 0.3   | 0    | 25.8                           | 15.8 | 1.5   | 0    | 4.1                       | 0.6  | 24.2  | 0.1  |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

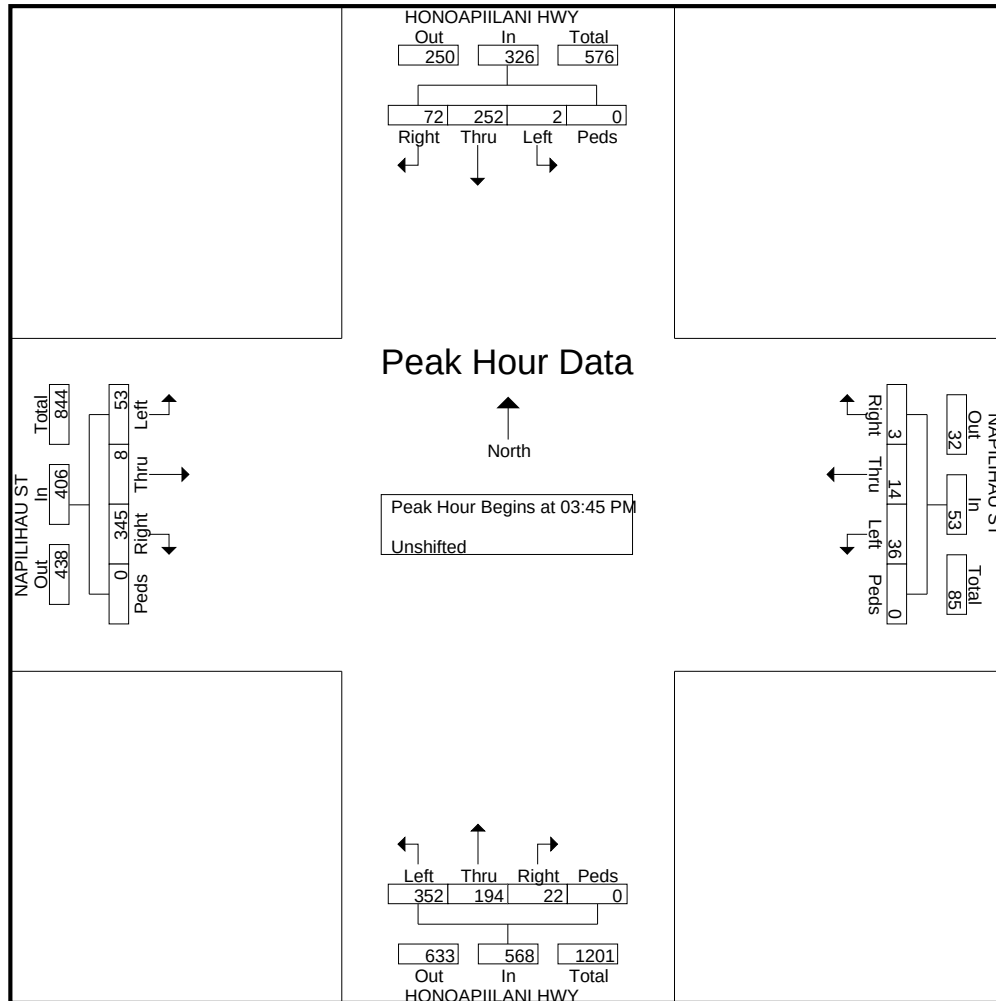
File Name : PM\_Honoapiilani Hwy - Napilihau St

Site Code : 00000000

Start Date : 11/30/2016

Page No : 2

|                                                                   | HONOAPIILANI HWY<br>Southbound |      |       |      |            | NAPILIHAI ST<br>Westbound |      |       |      |            | HONOAPIILANI HWY<br>Northbound |      |       |      |            | NAPILIHAI ST<br>Eastbound |      |       |      |            |            |
|-------------------------------------------------------------------|--------------------------------|------|-------|------|------------|---------------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|---------------------------|------|-------|------|------------|------------|
| Start Time                                                        | Left                           | Thru | Right | Peds | App. Total | Left                      | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Left                      | Thru | Right | Peds | App. Total | Int. Total |
| <b>Peak Hour Analysis From 03:45 PM to 04:30 PM - Peak 1 of 1</b> |                                |      |       |      |            |                           |      |       |      |            |                                |      |       |      |            |                           |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 03:45 PM              |                                |      |       |      |            |                           |      |       |      |            |                                |      |       |      |            |                           |      |       |      |            |            |
| 03:45 PM                                                          | 0                              | 56   | 15    | 0    | 71         | 10                        | 5    | 2     | 0    | 17         | 69                             | 48   | 6     | 0    | 123        | 16                        | 3    | 85    | 0    | 104        | 315        |
| 04:00 PM                                                          | 0                              | 75   | 38    | 0    | 113        | 11                        | 4    | 0     | 0    | 15         | 83                             | 52   | 4     | 0    | 139        | 9                         | 1    | 96    | 0    | 106        | 373        |
| 04:15 PM                                                          | 2                              | 68   | 6     | 0    | 76         | 7                         | 3    | 0     | 0    | 10         | 102                            | 58   | 9     | 0    | 169        | 13                        | 2    | 81    | 0    | 96         | 351        |
| 04:30 PM                                                          | 0                              | 53   | 13    | 0    | 66         | 8                         | 2    | 1     | 0    | 11         | 98                             | 36   | 3     | 0    | 137        | 15                        | 2    | 83    | 0    | 100        | 314        |
| Total Volume                                                      | 2                              | 252  | 72    | 0    | 326        | 36                        | 14   | 3     | 0    | 53         | 352                            | 194  | 22    | 0    | 568        | 53                        | 8    | 345   | 0    | 406        | 1353       |
| % App. Total                                                      | 0.6                            | 77.3 | 22.1  | 0    |            | 67.9                      | 26.4 | 5.7   | 0    |            | 62                             | 34.2 | 3.9   | 0    |            | 13.1                      | 2    | 85    | 0    |            |            |
| PHF                                                               | .250                           | .840 | .474  | .000 | .721       | .818                      | .700 | .375  | .000 | .779       | .863                           | .836 | .611  | .000 | .840       | .828                      | .667 | .898  | .000 | .958       | .907       |



# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : PM\_Honoapiilani Hwy - Hoohui Rd

Site Code : 00000000

Start Date : 11/30/2016

Page No : 1

## Groups Printed- Unshifted

|             | HONOAPIILANI HWY<br>Southbound |      |       |      | HOOHUI RD<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |      | HOOHUI RD<br>Eastbound |      |       |      |            |
|-------------|--------------------------------|------|-------|------|------------------------|------|-------|------|--------------------------------|------|-------|------|------------------------|------|-------|------|------------|
| Start Time  | Left                           | Thru | Right | Peds | Left                   | Thru | Right | Peds | Left                           | Thru | Right | Peds | Left                   | Thru | Right | Peds | Int. Total |
| 03:00 PM    | 3                              | 94   | 15    | 0    | 9                      | 3    | 1     | 0    | 32                             | 86   | 7     | 0    | 7                      | 2    | 26    | 0    | 285        |
| 03:15 PM    | 4                              | 111  | 13    | 1    | 6                      | 3    | 1     | 0    | 35                             | 109  | 12    | 0    | 13                     | 6    | 41    | 1    | 356        |
| 03:30 PM    | 2                              | 125  | 18    | 1    | 9                      | 2    | 2     | 1    | 41                             | 122  | 15    | 0    | 16                     | 5    | 38    | 0    | 397        |
| 03:45 PM    | 4                              | 120  | 22    | 0    | 12                     | 7    | 4     | 0    | 52                             | 131  | 7     | 0    | 17                     | 4    | 31    | 0    | 411        |
| Total       | 13                             | 450  | 68    | 2    | 36                     | 15   | 8     | 1    | 160                            | 448  | 41    | 0    | 53                     | 17   | 136   | 1    | 1449       |
| 04:00 PM    | 6                              | 143  | 20    | 0    | 5                      | 1    | 0     | 0    | 46                             | 112  | 10    | 0    | 14                     | 4    | 37    | 0    | 398        |
| 04:15 PM    | 7                              | 103  | 14    | 0    | 10                     | 1    | 2     | 0    | 41                             | 133  | 11    | 0    | 24                     | 7    | 27    | 0    | 380        |
| 04:30 PM    | 4                              | 130  | 19    | 0    | 14                     | 5    | 1     | 4    | 40                             | 117  | 12    | 0    | 13                     | 3    | 40    | 0    | 402        |
| 04:45 PM    | 8                              | 109  | 16    | 1    | 4                      | 4    | 3     | 0    | 58                             | 125  | 6     | 0    | 18                     | 5    | 36    | 0    | 393        |
| Total       | 25                             | 485  | 69    | 1    | 33                     | 11   | 6     | 4    | 185                            | 487  | 39    | 0    | 69                     | 19   | 140   | 0    | 1573       |
| Grand Total | 38                             | 935  | 137   | 3    | 69                     | 26   | 14    | 5    | 345                            | 935  | 80    | 0    | 122                    | 36   | 276   | 1    | 3022       |
| Apprch %    | 3.4                            | 84   | 12.3  | 0.3  | 60.5                   | 22.8 | 12.3  | 4.4  | 25.4                           | 68.8 | 5.9   | 0    | 28                     | 8.3  | 63.4  | 0.2  |            |
| Total %     | 1.3                            | 30.9 | 4.5   | 0.1  | 2.3                    | 0.9  | 0.5   | 0.2  | 11.4                           | 30.9 | 2.6   | 0    | 4                      | 1.2  | 9.1   | 0    |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

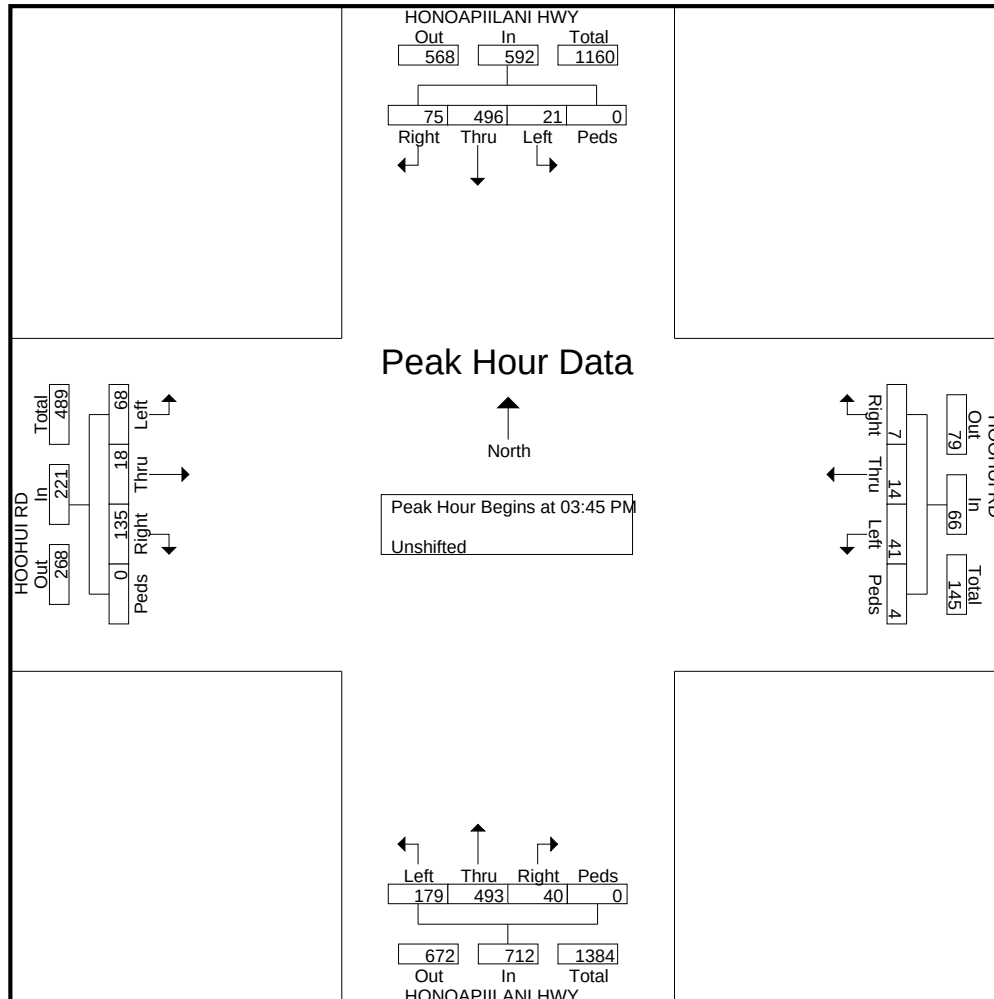
File Name : PM\_Honoapiilani Hwy - Hoohui Rd

Site Code : 00000000

Start Date : 11/30/2016

Page No : 2

|                                                                   | HONOAPIILANI HWY<br>Southbound |      |       |      |            | HOOHUI RD<br>Westbound |      |       |      |            | HONOAPIILANI HWY<br>Northbound |      |       |      |            | HOOHUI RD<br>Eastbound |      |       |      |            |            |
|-------------------------------------------------------------------|--------------------------------|------|-------|------|------------|------------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|------------------------|------|-------|------|------------|------------|
| Start Time                                                        | Left                           | Thru | Right | Peds | App. Total | Left                   | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Left                   | Thru | Right | Peds | App. Total | Int. Total |
| <b>Peak Hour Analysis From 03:45 PM to 04:30 PM - Peak 1 of 1</b> |                                |      |       |      |            |                        |      |       |      |            |                                |      |       |      |            |                        |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 03:45 PM              |                                |      |       |      |            |                        |      |       |      |            |                                |      |       |      |            |                        |      |       |      |            |            |
| 03:45 PM                                                          | 4                              | 120  | 22    | 0    | 146        | 12                     | 7    | 4     | 0    | 23         | 52                             | 131  | 7     | 0    | 190        | 17                     | 4    | 31    | 0    | 52         | 411        |
| 04:00 PM                                                          | 6                              | 143  | 20    | 0    | 169        | 5                      | 1    | 0     | 0    | 6          | 46                             | 112  | 10    | 0    | 168        | 14                     | 4    | 37    | 0    | 55         | 398        |
| 04:15 PM                                                          | 7                              | 103  | 14    | 0    | 124        | 10                     | 1    | 2     | 0    | 13         | 41                             | 133  | 11    | 0    | 185        | 24                     | 7    | 27    | 0    | 58         | 380        |
| 04:30 PM                                                          | 4                              | 130  | 19    | 0    | 153        | 14                     | 5    | 1     | 4    | 24         | 40                             | 117  | 12    | 0    | 169        | 13                     | 3    | 40    | 0    | 56         | 402        |
| Total Volume                                                      | 21                             | 496  | 75    | 0    | 592        | 41                     | 14   | 7     | 4    | 66         | 179                            | 493  | 40    | 0    | 712        | 68                     | 18   | 135   | 0    | 221        | 1591       |
| % App. Total                                                      | 3.5                            | 83.8 | 12.7  | 0    |            | 62.1                   | 21.2 | 10.6  | 6.1  |            | 25.1                           | 69.2 | 5.6   | 0    |            | 30.8                   | 8.1  | 61.1  | 0    |            |            |
| PHF                                                               | .750                           | .867 | .852  | .000 | .876       | .732                   | .500 | .438  | .250 | .688       | .861                           | .927 | .833  | .000 | .937       | .708                   | .643 | .844  | .000 | .953       | .968       |



# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : PM\_Honoapiilani Hwy - Akahahele St

Site Code : 00000000

Start Date : 12/6/2016

Page No : 1

**Groups Printed- Unshifted - Bank 1**

[illegible]

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

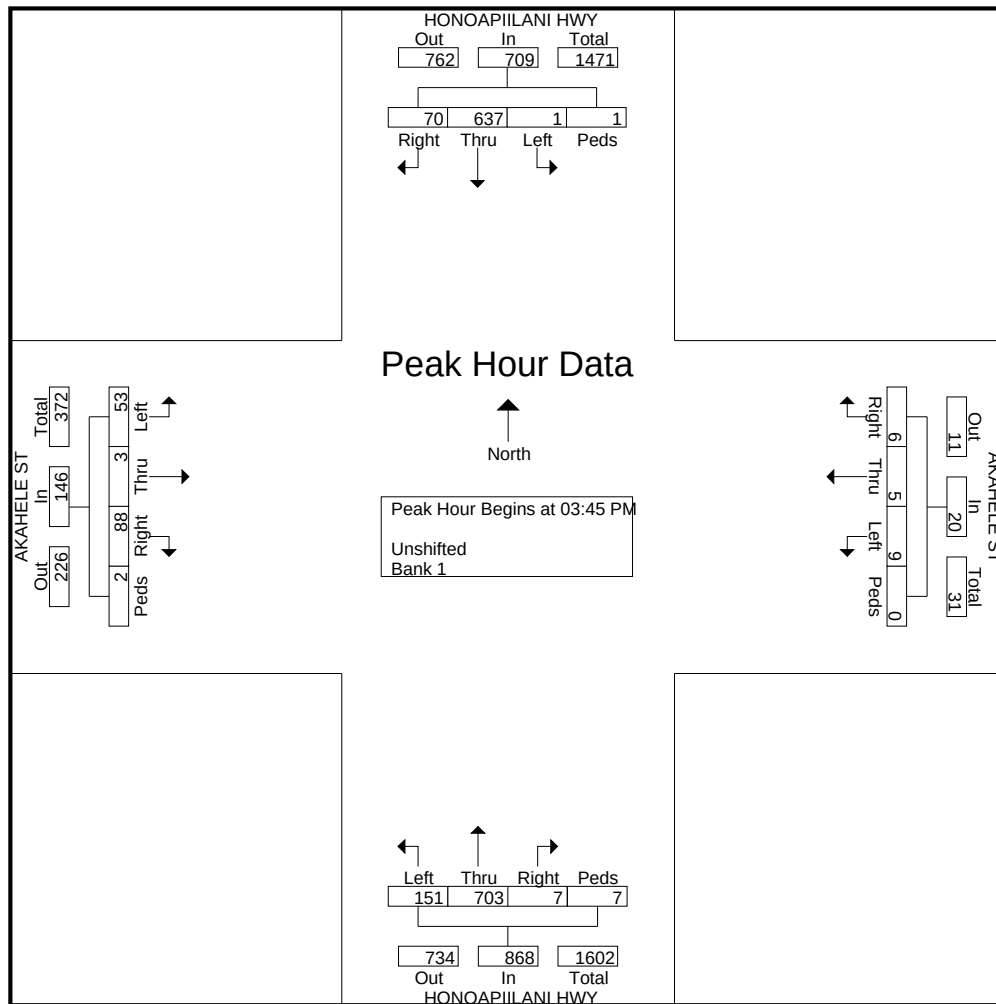
File Name : PM\_Honoapiilani Hwy - Akahele St

Site Code : 00000000

Start Date : 12/6/2016

Page No : 2

|                                                            | HONOAPIILANI HWY<br>Southbound |      |       |      |            | AKAHELE ST<br>Westbound |      |       |      |            | HONOAPIILANI HWY<br>Northbound |      |       |      |            | AKAHELE ST<br>Eastbound |      |       |      |            |            |
|------------------------------------------------------------|--------------------------------|------|-------|------|------------|-------------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|-------------------------|------|-------|------|------------|------------|
| Start Time                                                 | Left                           | Thru | Right | Peds | App. Total | Left                    | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Left                    | Thru | Right | Peds | App. Total | Int. Total |
| Peak Hour Analysis From 03:45 PM to 04:30 PM - Peak 1 of 1 |                                |      |       |      |            |                         |      |       |      |            |                                |      |       |      |            |                         |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 03:45 PM       |                                |      |       |      |            |                         |      |       |      |            |                                |      |       |      |            |                         |      |       |      |            |            |
| 03:45 PM                                                   | 0                              | 151  | 16    | 0    | 167        | 1                       | 3    | 1     | 0    | 5          | 31                             | 159  | 2     | 5    | 197        | 14                      | 0    | 13    | 1    | 28         | 397        |
| 04:00 PM                                                   | 1                              | 163  | 25    | 0    | 189        | 2                       | 0    | 3     | 0    | 5          | 52                             | 168  | 2     | 0    | 222        | 6                       | 0    | 19    | 0    | 25         | 441        |
| 04:15 PM                                                   | 0                              | 144  | 19    | 0    | 163        | 1                       | 1    | 0     | 0    | 2          | 36                             | 185  | 2     | 0    | 223        | 15                      | 2    | 32    | 1    | 50         | 438        |
| 04:30 PM                                                   | 0                              | 179  | 10    | 1    | 190        | 5                       | 1    | 2     | 0    | 8          | 32                             | 191  | 1     | 2    | 226        | 18                      | 1    | 24    | 0    | 43         | 467        |
| Total Volume                                               | 1                              | 637  | 70    | 1    | 709        | 9                       | 5    | 6     | 0    | 20         | 151                            | 703  | 7     | 7    | 868        | 53                      | 3    | 88    | 2    | 146        | 1743       |
| % App. Total                                               | 0.1                            | 89.8 | 9.9   | 0.1  |            | 45                      | 25   | 30    | 0    |            | 17.4                           | 81   | 0.8   | 0.8  |            | 36.3                    | 2.1  | 60.3  | 1.4  |            |            |
| PHF                                                        | .250                           | .890 | .700  | .250 | .933       | .450                    | .417 | .500  | .000 | .625       | .726                           | .920 | .875  | .350 | .960       | .736                    | .375 | .688  | .500 | .730       | .933       |





# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : PM\_Honoapiilani Hwy - Lower Honoapiilani Rd

Site Code : 00000000

Start Date : 12/6/2016

Page No : 1

Groups Printed- Unshifted

|             | HONOAPIILANI HWY<br>Southbound |      |       |      | LOWER HONOAPIILANI R<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |      | LOWER HONOAPIILANI R<br>Eastbound |      |       |      |            |
|-------------|--------------------------------|------|-------|------|-----------------------------------|------|-------|------|--------------------------------|------|-------|------|-----------------------------------|------|-------|------|------------|
| Start Time  | Left                           | Thru | Right | Peds | Left                              | Thru | Right | Peds | Left                           | Thru | Right | Peds | Left                              | Thru | Right | Peds | Int. Total |
| 03:00 PM    | 0                              | 223  | 18    | 1    | 17                                | 3    | 1     | 1    | 105                            | 181  | 2     | 0    | 13                                | 4    | 154   | 3    | 726        |
| 03:15 PM    | 1                              | 62   | 0     | 0    | 29                                | 1    | 1     | 0    | 130                            | 187  | 7     | 0    | 12                                | 1    | 137   | 0    | 568        |
| 03:30 PM    | 1                              | 159  | 4     | 0    | 107                               | 3    | 0     | 0    | 158                            | 170  | 6     | 0    | 13                                | 3    | 192   | 0    | 816        |
| 03:45 PM    | 0                              | 157  | 0     | 0    | 36                                | 1    | 2     | 0    | 166                            | 187  | 0     | 0    | 5                                 | 2    | 88    | 0    | 644        |
| Total       | 2                              | 601  | 22    | 1    | 189                               | 8    | 4     | 1    | 559                            | 725  | 15    | 0    | 43                                | 10   | 571   | 3    | 2754       |
| 04:00 PM    | 0                              | 171  | 0     | 1    | 19                                | 2    | 1     | 0    | 102                            | 211  | 1     | 0    | 29                                | 0    | 168   | 0    | 705        |
| 04:15 PM    | 1                              | 187  | 0     | 0    | 12                                | 6    | 1     | 2    | 152                            | 181  | 3     | 0    | 14                                | 0    | 127   | 0    | 686        |
| 04:30 PM    | 0                              | 193  | 16    | 0    | 8                                 | 1    | 3     | 0    | 128                            | 178  | 2     | 0    | 22                                | 2    | 163   | 0    | 716        |
| 04:45 PM    | 0                              | 122  | 17    | 0    | 8                                 | 2    | 4     | 0    | 135                            | 172  | 3     | 0    | 14                                | 0    | 137   | 3    | 617        |
| Total       | 1                              | 673  | 33    | 1    | 47                                | 11   | 9     | 2    | 517                            | 742  | 9     | 0    | 79                                | 2    | 595   | 3    | 2724       |
| Grand Total | 3                              | 1274 | 55    | 2    | 236                               | 19   | 13    | 3    | 1076                           | 1467 | 24    | 0    | 122                               | 12   | 1166  | 6    | 5478       |
| Apprch %    | 0.2                            | 95.5 | 4.1   | 0.1  | 87.1                              | 7    | 4.8   | 1.1  | 41.9                           | 57.1 | 0.9   | 0    | 9.3                               | 0.9  | 89.3  | 0.5  |            |
| Total %     | 0.1                            | 23.3 | 1     | 0    | 4.3                               | 0.3  | 0.2   | 0.1  | 19.6                           | 26.8 | 0.4   | 0    | 2.2                               | 0.2  | 21.3  | 0.1  |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

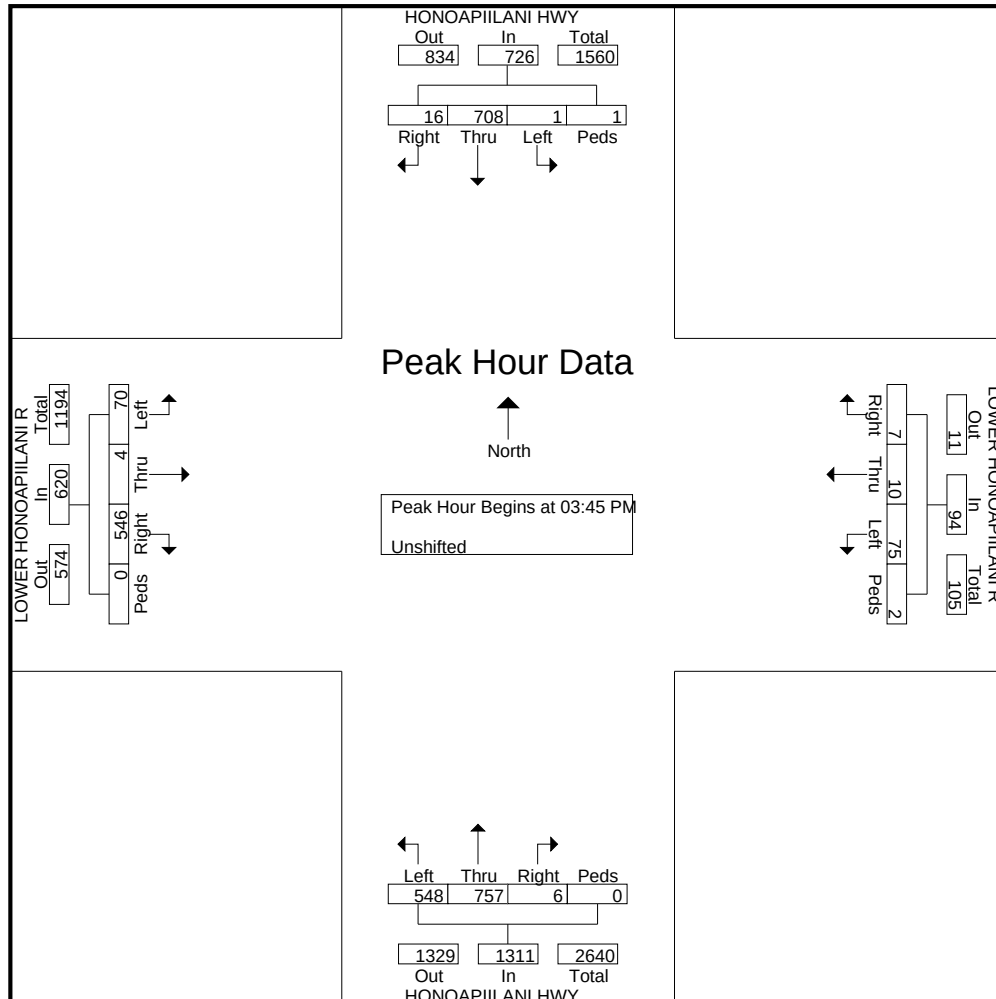
File Name : PM\_Honoapiilani Hwy - Lower Honoapiilani Rd

Site Code : 00000000

Start Date : 12/6/2016

Page No : 2

|                                                                   | HONOAPIILANI HWY<br>Southbound |      |       |      |            | LOWER HONOAPIILANI R<br>Westbound |      |       |      |            | HONOAPIILANI HWY<br>Northbound |      |       |      |            | LOWER HONOAPIILANI R<br>Eastbound |      |       |      |            |            |
|-------------------------------------------------------------------|--------------------------------|------|-------|------|------------|-----------------------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|-----------------------------------|------|-------|------|------------|------------|
| Start Time                                                        | Left                           | Thru | Right | Peds | App. Total | Left                              | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Left                              | Thru | Right | Peds | App. Total | Int. Total |
| <b>Peak Hour Analysis From 03:45 PM to 04:30 PM - Peak 1 of 1</b> |                                |      |       |      |            |                                   |      |       |      |            |                                |      |       |      |            |                                   |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 03:45 PM              |                                |      |       |      |            |                                   |      |       |      |            |                                |      |       |      |            |                                   |      |       |      |            |            |
| 03:45 PM                                                          | 0                              | 157  | 0     | 0    | 157        | 36                                | 1    | 2     | 0    | 39         | 166                            | 187  | 0     | 0    | 353        | 5                                 | 2    | 88    | 0    | 95         | 644        |
| 04:00 PM                                                          | 0                              | 171  | 0     | 1    | 172        | 19                                | 2    | 1     | 0    | 22         | 102                            | 211  | 1     | 0    | 314        | 29                                | 0    | 168   | 0    | 197        | 705        |
| 04:15 PM                                                          | 1                              | 187  | 0     | 0    | 188        | 12                                | 6    | 1     | 2    | 21         | 152                            | 181  | 3     | 0    | 336        | 14                                | 0    | 127   | 0    | 141        | 686        |
| 04:30 PM                                                          | 0                              | 193  | 16    | 0    | 209        | 8                                 | 1    | 3     | 0    | 12         | 128                            | 178  | 2     | 0    | 308        | 22                                | 2    | 163   | 0    | 187        | 716        |
| Total Volume                                                      | 1                              | 708  | 16    | 1    | 726        | 75                                | 10   | 7     | 2    | 94         | 548                            | 757  | 6     | 0    | 1311       | 70                                | 4    | 546   | 0    | 620        | 2751       |
| % App. Total                                                      | 0.1                            | 97.5 | 2.2   | 0.1  |            | 79.8                              | 10.6 | 7.4   | 2.1  |            | 41.8                           | 57.7 | 0.5   | 0    |            | 11.3                              | 0.6  | 88.1  | 0    |            |            |
| PHF                                                               | .250                           | .917 | .250  | .250 | .868       | .521                              | .417 | .583  | .250 | .603       | .825                           | .897 | .500  | .000 | .928       | .603                              | .500 | .813  | .000 | .787       | .961       |



# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : PM\_Honoapiilani Hwy - Halawai Dr

Site Code : 00000000

Start Date : 12/6/2016

Page No : 1

Groups Printed- Unshifted

|             | HONOAPIILANI HWY<br>Southbound |      |       |      | HALAWAI DR<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |      | HALAWAI DR<br>Eastbound |      |       |      |            |
|-------------|--------------------------------|------|-------|------|-------------------------|------|-------|------|--------------------------------|------|-------|------|-------------------------|------|-------|------|------------|
| Start Time  | Left                           | Thru | Right | Peds | Left                    | Thru | Right | Peds | Left                           | Thru | Right | Peds | Left                    | Thru | Right | Peds | Int. Total |
| 03:00 PM    | 3                              | 355  | 20    | 14   | 2                       | 0    | 1     | 1    | 26                             | 281  | 2     | 0    | 6                       | 3    | 13    | 0    | 727        |
| 03:15 PM    | 2                              | 322  | 25    | 23   | 5                       | 1    | 2     | 0    | 15                             | 319  | 1     | 0    | 18                      | 2    | 13    | 0    | 748        |
| 03:30 PM    | 4                              | 401  | 24    | 10   | 7                       | 1    | 4     | 2    | 14                             | 285  | 1     | 0    | 16                      | 1    | 19    | 0    | 789        |
| 03:45 PM    | 1                              | 315  | 7     | 5    | 5                       | 0    | 1     | 3    | 17                             | 319  | 0     | 0    | 4                       | 1    | 16    | 0    | 694        |
| Total       | 10                             | 1393 | 76    | 52   | 19                      | 2    | 8     | 6    | 72                             | 1204 | 4     | 0    | 44                      | 7    | 61    | 0    | 2958       |
| 04:00 PM    | 5                              | 345  | 8     | 2    | 4                       | 0    | 1     | 1    | 15                             | 319  | 4     | 0    | 7                       | 0    | 11    | 0    | 722        |
| 04:15 PM    | 2                              | 317  | 12    | 4    | 1                       | 0    | 1     | 1    | 16                             | 324  | 4     | 0    | 6                       | 0    | 9     | 0    | 697        |
| 04:30 PM    | 0                              | 355  | 6     | 4    | 4                       | 0    | 1     | 2    | 20                             | 310  | 2     | 0    | 3                       | 0    | 27    | 0    | 734        |
| 04:45 PM    | 4                              | 303  | 7     | 10   | 5                       | 0    | 3     | 0    | 10                             | 285  | 4     | 0    | 7                       | 0    | 21    | 0    | 659        |
| Total       | 11                             | 1320 | 33    | 20   | 14                      | 0    | 6     | 4    | 61                             | 1238 | 14    | 0    | 23                      | 0    | 68    | 0    | 2812       |
| Grand Total | 21                             | 2713 | 109   | 72   | 33                      | 2    | 14    | 10   | 133                            | 2442 | 18    | 0    | 67                      | 7    | 129   | 0    | 5770       |
| Apprch %    | 0.7                            | 93.1 | 3.7   | 2.5  | 55.9                    | 3.4  | 23.7  | 16.9 | 5.1                            | 94.2 | 0.7   | 0    | 33                      | 3.4  | 63.5  | 0    |            |
| Total %     | 0.4                            | 47   | 1.9   | 1.2  | 0.6                     | 0    | 0.2   | 0.2  | 2.3                            | 42.3 | 0.3   | 0    | 1.2                     | 0.1  | 2.2   | 0    |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

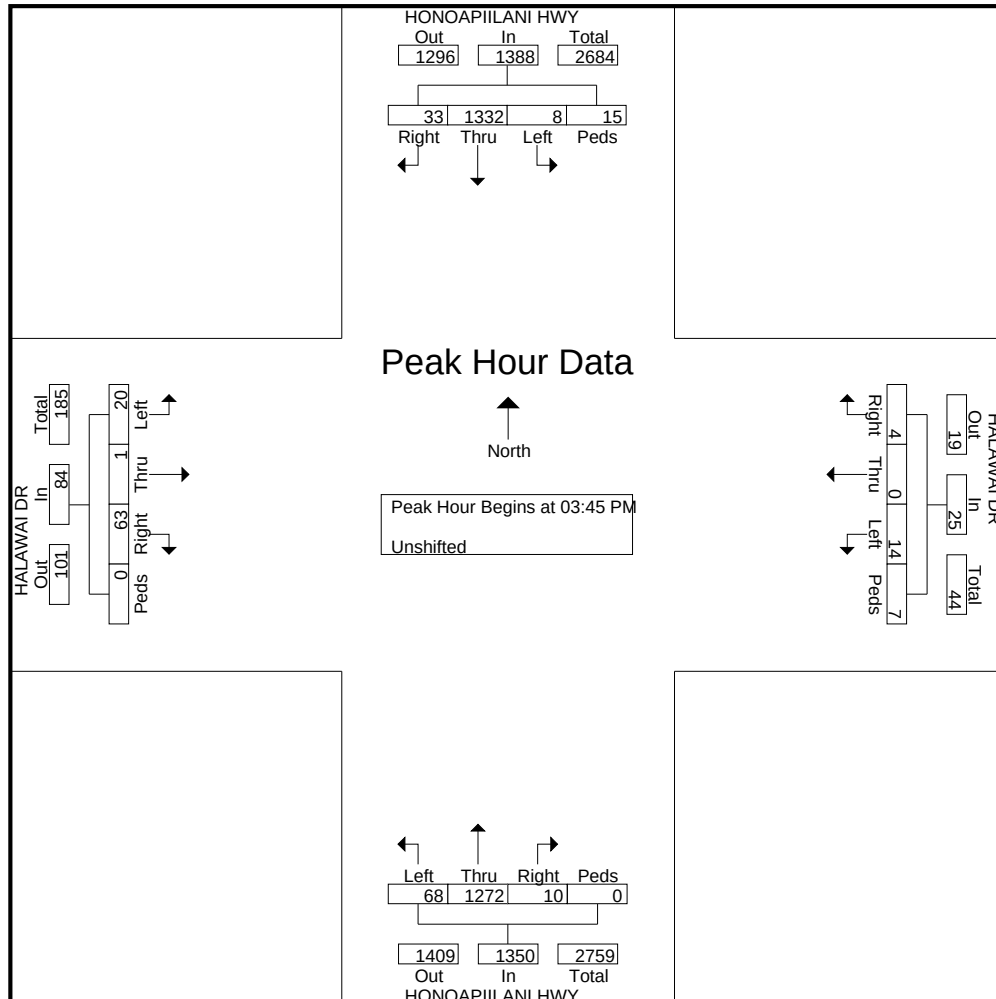
File Name : PM\_Honoapiilani Hwy - Halawai Dr

Site Code : 00000000

Start Date : 12/6/2016

Page No : 2

|                                                                   | HONOAPIILANI HWY<br>Southbound |      |       |      |            | HALAWAI DR<br>Westbound |      |       |      |            | HONOAPIILANI HWY<br>Northbound |      |       |      |            | HALAWAI DR<br>Eastbound |      |       |      |            |            |
|-------------------------------------------------------------------|--------------------------------|------|-------|------|------------|-------------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|-------------------------|------|-------|------|------------|------------|
| Start Time                                                        | Left                           | Thru | Right | Peds | App. Total | Left                    | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Left                    | Thru | Right | Peds | App. Total | Int. Total |
| <b>Peak Hour Analysis From 03:45 PM to 04:30 PM - Peak 1 of 1</b> |                                |      |       |      |            |                         |      |       |      |            |                                |      |       |      |            |                         |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 03:45 PM              |                                |      |       |      |            |                         |      |       |      |            |                                |      |       |      |            |                         |      |       |      |            |            |
| 03:45 PM                                                          | 1                              | 315  | 7     | 5    | 328        | 5                       | 0    | 1     | 3    | 9          | 17                             | 319  | 0     | 0    | 336        | 4                       | 1    | 16    | 0    | 21         | 694        |
| 04:00 PM                                                          | 5                              | 345  | 8     | 2    | 360        | 4                       | 0    | 1     | 1    | 6          | 15                             | 319  | 4     | 0    | 338        | 7                       | 0    | 11    | 0    | 18         | 722        |
| 04:15 PM                                                          | 2                              | 317  | 12    | 4    | 335        | 1                       | 0    | 1     | 1    | 3          | 16                             | 324  | 4     | 0    | 344        | 6                       | 0    | 9     | 0    | 15         | 697        |
| 04:30 PM                                                          | 0                              | 355  | 6     | 4    | 365        | 4                       | 0    | 1     | 2    | 7          | 20                             | 310  | 2     | 0    | 332        | 3                       | 0    | 27    | 0    | 30         | 734        |
| Total Volume                                                      | 8                              | 1332 | 33    | 15   | 1388       | 14                      | 0    | 4     | 7    | 25         | 68                             | 1272 | 10    | 0    | 1350       | 20                      | 1    | 63    | 0    | 84         | 2847       |
| % App. Total                                                      | 0.6                            | 96   | 2.4   | 1.1  |            | 56                      | 0    | 16    | 28   |            | 5                              | 94.2 | 0.7   | 0    |            | 23.8                    | 1.2  | 75    | 0    |            |            |
| PHF                                                               | .400                           | .938 | .688  | .750 | .951       | .700                    | .000 | 1.00  | .583 | .694       | .850                           | .981 | .625  | .000 | .981       | .714                    | .250 | .583  | .000 | .700       | .970       |



# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : PM\_Honoapiilani Hwy - Puukolii Rd

Site Code : 00000000

Start Date : 12/6/2016

Page No : 1

## Groups Printed- Unshifted

|             | HONOAPIILANI HWY<br>Southbound |      |       |      | PUUKOLII RD<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |      | PUUKOLII RD<br>Eastbound |      |       |      |            |
|-------------|--------------------------------|------|-------|------|--------------------------|------|-------|------|--------------------------------|------|-------|------|--------------------------|------|-------|------|------------|
| Start Time  | Left                           | Thru | Right | Peds | Left                     | Thru | Right | Peds | Left                           | Thru | Right | Peds | Left                     | Thru | Right | Peds | Int. Total |
| 03:00 PM    | 9                              | 340  | 11    | 0    | 7                        | 2    | 6     | 0    | 25                             | 285  | 16    | 0    | 18                       | 2    | 40    | 0    | 761        |
| 03:15 PM    | 13                             | 360  | 12    | 0    | 8                        | 1    | 8     | 0    | 22                             | 308  | 17    | 0    | 12                       | 0    | 22    | 0    | 783        |
| 03:30 PM    | 9                              | 412  | 16    | 0    | 16                       | 0    | 5     | 0    | 24                             | 275  | 18    | 0    | 22                       | 0    | 26    | 0    | 823        |
| 03:45 PM    | 10                             | 332  | 15    | 1    | 18                       | 1    | 9     | 0    | 28                             | 298  | 13    | 0    | 16                       | 1    | 22    | 0    | 764        |
| Total       | 41                             | 1444 | 54    | 1    | 49                       | 4    | 28    | 0    | 99                             | 1166 | 64    | 0    | 68                       | 3    | 110   | 0    | 3131       |
| 04:00 PM    | 8                              | 312  | 23    | 3    | 17                       | 2    | 12    | 1    | 23                             | 301  | 14    | 0    | 14                       | 1    | 50    | 0    | 781        |
| 04:15 PM    | 9                              | 338  | 12    | 0    | 16                       | 0    | 11    | 0    | 36                             | 323  | 16    | 0    | 15                       | 2    | 46    | 0    | 824        |
| 04:30 PM    | 2                              | 343  | 33    | 2    | 12                       | 1    | 8     | 0    | 34                             | 286  | 12    | 0    | 19                       | 1    | 46    | 0    | 799        |
| 04:45 PM    | 5                              | 296  | 13    | 0    | 8                        | 1    | 6     | 1    | 16                             | 255  | 4     | 0    | 22                       | 2    | 24    | 0    | 653        |
| Total       | 24                             | 1289 | 81    | 5    | 53                       | 4    | 37    | 2    | 109                            | 1165 | 46    | 0    | 70                       | 6    | 166   | 0    | 3057       |
| Grand Total | 65                             | 2733 | 135   | 6    | 102                      | 8    | 65    | 2    | 208                            | 2331 | 110   | 0    | 138                      | 9    | 276   | 0    | 6188       |
| Apprch %    | 2.2                            | 93   | 4.6   | 0.2  | 57.6                     | 4.5  | 36.7  | 1.1  | 7.9                            | 88   | 4.2   | 0    | 32.6                     | 2.1  | 65.2  | 0    |            |
| Total %     | 1.1                            | 44.2 | 2.2   | 0.1  | 1.6                      | 0.1  | 1.1   | 0    | 3.4                            | 37.7 | 1.8   | 0    | 2.2                      | 0.1  | 4.5   | 0    |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

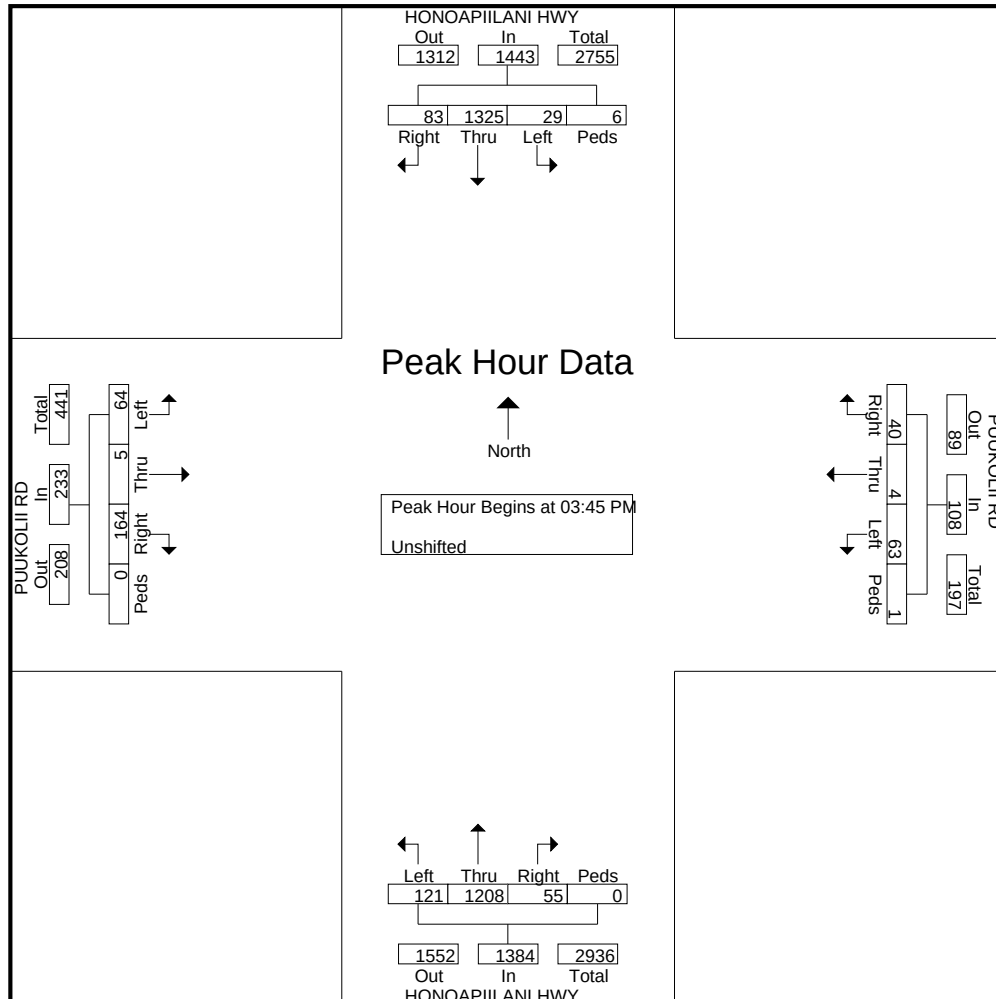
File Name : PM\_Honoapiilani Hwy - Puukolii Rd

Site Code : 00000000

Start Date : 12/6/2016

Page No : 2

|                                                                   | HONOAPIILANI HWY<br>Southbound |      |       |      |            | PUUKOLII RD<br>Westbound |      |       |      |            | HONOAPIILANI HWY<br>Northbound |      |       |      |            | PUUKOLII RD<br>Eastbound |      |       |      |            |            |
|-------------------------------------------------------------------|--------------------------------|------|-------|------|------------|--------------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|--------------------------|------|-------|------|------------|------------|
| Start Time                                                        | Left                           | Thru | Right | Peds | App. Total | Left                     | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Left                     | Thru | Right | Peds | App. Total | Int. Total |
| <b>Peak Hour Analysis From 03:45 PM to 04:30 PM - Peak 1 of 1</b> |                                |      |       |      |            |                          |      |       |      |            |                                |      |       |      |            |                          |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 03:45 PM              |                                |      |       |      |            |                          |      |       |      |            |                                |      |       |      |            |                          |      |       |      |            |            |
| 03:45 PM                                                          | 10                             | 332  | 15    | 1    | 358        | 18                       | 1    | 9     | 0    | 28         | 28                             | 298  | 13    | 0    | 339        | 16                       | 1    | 22    | 0    | 39         | 764        |
| 04:00 PM                                                          | 8                              | 312  | 23    | 3    | 346        | 17                       | 2    | 12    | 1    | 32         | 23                             | 301  | 14    | 0    | 338        | 14                       | 1    | 50    | 0    | 65         | 781        |
| 04:15 PM                                                          | 9                              | 338  | 12    | 0    | 359        | 16                       | 0    | 11    | 0    | 27         | 36                             | 323  | 16    | 0    | 375        | 15                       | 2    | 46    | 0    | 63         | 824        |
| 04:30 PM                                                          | 2                              | 343  | 33    | 2    | 380        | 12                       | 1    | 8     | 0    | 21         | 34                             | 286  | 12    | 0    | 332        | 19                       | 1    | 46    | 0    | 66         | 799        |
| Total Volume                                                      | 29                             | 1325 | 83    | 6    | 1443       | 63                       | 4    | 40    | 1    | 108        | 121                            | 1208 | 55    | 0    | 1384       | 64                       | 5    | 164   | 0    | 233        | 3168       |
| % App. Total                                                      | 2                              | 91.8 | 5.8   | 0.4  |            | 58.3                     | 3.7  | 37    | 0.9  |            | 8.7                            | 87.3 | 4     | 0    |            | 27.5                     | 2.1  | 70.4  | 0    |            |            |
| PHF                                                               | .725                           | .966 | .629  | .500 | .949       | .875                     | .500 | .833  | .250 | .844       | .840                           | .935 | .859  | .000 | .923       | .842                     | .625 | .820  | .000 | .883       | .961       |



# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : PM\_Honoapiilani Hwy - Kaanapali Pkwy

Site Code : 00000000

Start Date : 12/6/2016

Page No : 1

Groups Printed- Unshifted

|             | HONOAPIILANI HWY<br>Southbound |      |       |      | KAANAPALI PKWY<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |      | KAANAPALI PKWY<br>Eastbound |      |       |      |            |
|-------------|--------------------------------|------|-------|------|-----------------------------|------|-------|------|--------------------------------|------|-------|------|-----------------------------|------|-------|------|------------|
| Start Time  | Left                           | Thru | Right | Peds | Left                        | Thru | Right | Peds | Left                           | Thru | Right | Peds | Left                        | Thru | Right | Peds | Int. Total |
| 03:00 PM    | 7                              | 323  | 37    | 0    | 3                           | 1    | 2     | 0    | 102                            | 268  | 2     | 0    | 26                          | 23   | 98    | 0    | 892        |
| 03:15 PM    | 6                              | 321  | 15    | 0    | 4                           | 0    | 2     | 1    | 137                            | 351  | 2     | 0    | 68                          | 1    | 121   | 0    | 1029       |
| 03:30 PM    | 7                              | 363  | 32    | 0    | 5                           | 2    | 1     | 0    | 95                             | 264  | 3     | 0    | 51                          | 0    | 115   | 0    | 938        |
| 03:45 PM    | 15                             | 331  | 34    | 3    | 6                           | 0    | 1     | 3    | 100                            | 340  | 1     | 0    | 55                          | 2    | 107   | 0    | 998        |
| Total       | 35                             | 1338 | 118   | 3    | 18                          | 3    | 6     | 4    | 434                            | 1223 | 8     | 0    | 200                         | 26   | 441   | 0    | 3857       |
| 04:00 PM    | 15                             | 364  | 32    | 0    | 1                           | 0    | 1     | 0    | 101                            | 302  | 2     | 0    | 71                          | 0    | 185   | 0    | 1074       |
| 04:15 PM    | 12                             | 345  | 34    | 1    | 4                           | 0    | 1     | 1    | 86                             | 316  | 1     | 0    | 72                          | 0    | 169   | 0    | 1042       |
| 04:30 PM    | 6                              | 376  | 20    | 0    | 2                           | 0    | 1     | 0    | 87                             | 282  | 2     | 0    | 67                          | 0    | 136   | 0    | 979        |
| 04:45 PM    | 8                              | 322  | 30    | 0    | 3                           | 0    | 3     | 0    | 80                             | 243  | 3     | 0    | 50                          | 0    | 115   | 0    | 857        |
| Total       | 41                             | 1407 | 116   | 1    | 10                          | 0    | 6     | 1    | 354                            | 1143 | 8     | 0    | 260                         | 0    | 605   | 0    | 3952       |
| Grand Total | 76                             | 2745 | 234   | 4    | 28                          | 3    | 12    | 5    | 788                            | 2366 | 16    | 0    | 460                         | 26   | 1046  | 0    | 7809       |
| Apprch %    | 2.5                            | 89.7 | 7.6   | 0.1  | 58.3                        | 6.2  | 25    | 10.4 | 24.9                           | 74.6 | 0.5   | 0    | 30                          | 1.7  | 68.3  | 0    |            |
| Total %     | 1                              | 35.2 | 3     | 0.1  | 0.4                         | 0    | 0.2   | 0.1  | 10.1                           | 30.3 | 0.2   | 0    | 5.9                         | 0.3  | 13.4  | 0    |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

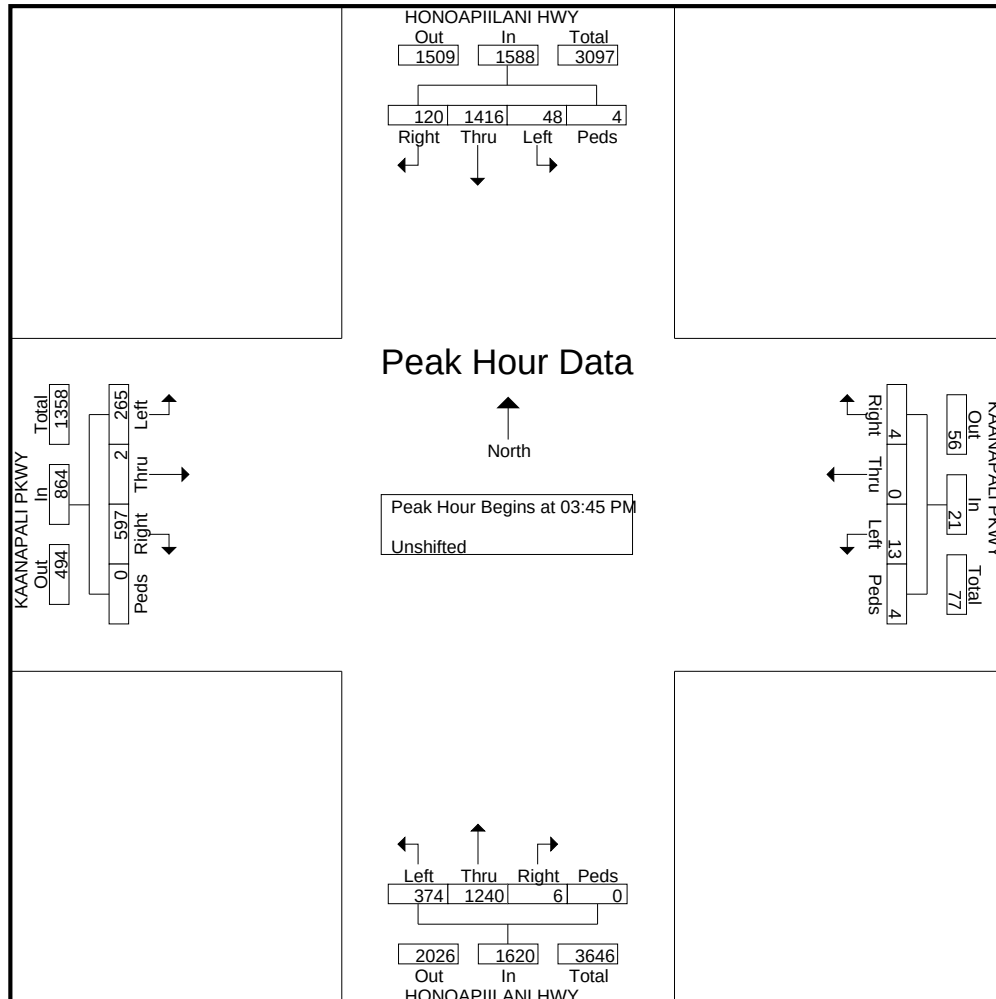
File Name : PM\_Honoapiilani Hwy - Kaanapali Pkwy

Site Code : 00000000

Start Date : 12/6/2016

Page No : 2

|                                                                   | HONOAPIILANI HWY<br>Southbound |      |       |      |            | KAANAPALI PKWY<br>Westbound |      |       |      |            | HONOAPIILANI HWY<br>Northbound |      |       |      |            | KAANAPALI PKWY<br>Eastbound |      |       |      |            |            |
|-------------------------------------------------------------------|--------------------------------|------|-------|------|------------|-----------------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|-----------------------------|------|-------|------|------------|------------|
| Start Time                                                        | Left                           | Thru | Right | Peds | App. Total | Left                        | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Left                        | Thru | Right | Peds | App. Total | Int. Total |
| <b>Peak Hour Analysis From 03:45 PM to 04:30 PM - Peak 1 of 1</b> |                                |      |       |      |            |                             |      |       |      |            |                                |      |       |      |            |                             |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 03:45 PM              |                                |      |       |      |            |                             |      |       |      |            |                                |      |       |      |            |                             |      |       |      |            |            |
| 03:45 PM                                                          | 15                             | 331  | 34    | 3    | 383        | 6                           | 0    | 1     | 3    | 10         | 100                            | 340  | 1     | 0    | 441        | 55                          | 2    | 107   | 0    | 164        | 998        |
| 04:00 PM                                                          | 15                             | 364  | 32    | 0    | 411        | 1                           | 0    | 1     | 0    | 2          | 101                            | 302  | 2     | 0    | 405        | 71                          | 0    | 185   | 0    | 256        | 1074       |
| 04:15 PM                                                          | 12                             | 345  | 34    | 1    | 392        | 4                           | 0    | 1     | 1    | 6          | 86                             | 316  | 1     | 0    | 403        | 72                          | 0    | 169   | 0    | 241        | 1042       |
| 04:30 PM                                                          | 6                              | 376  | 20    | 0    | 402        | 2                           | 0    | 1     | 0    | 3          | 87                             | 282  | 2     | 0    | 371        | 67                          | 0    | 136   | 0    | 203        | 979        |
| Total Volume                                                      | 48                             | 1416 | 120   | 4    | 1588       | 13                          | 0    | 4     | 4    | 21         | 374                            | 1240 | 6     | 0    | 1620       | 265                         | 2    | 597   | 0    | 864        | 4093       |
| % App. Total                                                      | 3                              | 89.2 | 7.6   | 0.3  |            | 61.9                        | 0    | 19    | 19   |            | 23.1                           | 76.5 | 0.4   | 0    |            | 30.7                        | 0.2  | 69.1  | 0    |            |            |
| PHF                                                               | .800                           | .941 | .882  | .333 | .966       | .542                        | .000 | 1.00  | .333 | .525       | .926                           | .912 | .750  | .000 | .918       | .920                        | .250 | .807  | .000 | .844       | .953       |





# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : PM\_Honoapiilani Hwy - Leialii Pkwy

Site Code : 00000000

Start Date : 12/6/2016

Page No : 1

## Groups Printed- Unshifted

|             | HONOAPIILANI HWY<br>Southbound |      |       |      | LEIALII PKWY<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |      | LEIALII PKWY<br>Eastbound |      |       |      |            |
|-------------|--------------------------------|------|-------|------|---------------------------|------|-------|------|--------------------------------|------|-------|------|---------------------------|------|-------|------|------------|
| Start Time  | Left                           | Thru | Right | Peds | Left                      | Thru | Right | Peds | Left                           | Thru | Right | Peds | Left                      | Thru | Right | Peds | Int. Total |
| 03:00 PM    | 23                             | 429  | 2     | 1    | 19                        | 0    | 13    | 1    | 2                              | 401  | 27    | 0    | 1                         | 0    | 1     | 0    | 920        |
| 03:15 PM    | 16                             | 425  | 3     | 3    | 31                        | 0    | 20    | 3    | 0                              | 378  | 24    | 0    | 2                         | 0    | 2     | 0    | 907        |
| 03:30 PM    | 22                             | 483  | 0     | 1    | 29                        | 0    | 13    | 1    | 0                              | 387  | 23    | 0    | 0                         | 0    | 0     | 0    | 959        |
| 03:45 PM    | 15                             | 441  | 2     | 0    | 20                        | 0    | 14    | 0    | 2                              | 420  | 21    | 0    | 2                         | 0    | 0     | 0    | 937        |
| Total       | 76                             | 1778 | 7     | 5    | 99                        | 0    | 60    | 5    | 4                              | 1586 | 95    | 0    | 5                         | 0    | 3     | 0    | 3723       |
| 04:00 PM    | 23                             | 490  | 1     | 0    | 20                        | 0    | 18    | 0    | 2                              | 414  | 22    | 0    | 3                         | 0    | 1     | 0    | 994        |
| 04:15 PM    | 22                             | 521  | 1     | 0    | 22                        | 1    | 7     | 0    | 4                              | 355  | 24    | 0    | 0                         | 0    | 2     | 0    | 959        |
| 04:30 PM    | 17                             | 501  | 0     | 0    | 23                        | 1    | 14    | 0    | 1                              | 374  | 21    | 0    | 2                         | 0    | 1     | 0    | 955        |
| 04:45 PM    | 15                             | 435  | 0     | 1    | 20                        | 0    | 10    | 1    | 1                              | 327  | 20    | 0    | 2                         | 0    | 2     | 0    | 834        |
| Total       | 77                             | 1947 | 2     | 1    | 85                        | 2    | 49    | 1    | 8                              | 1470 | 87    | 0    | 7                         | 0    | 6     | 0    | 3742       |
| Grand Total | 153                            | 3725 | 9     | 6    | 184                       | 2    | 109   | 6    | 12                             | 3056 | 182   | 0    | 12                        | 0    | 9     | 0    | 7465       |
| Apprch %    | 3.9                            | 95.7 | 0.2   | 0.2  | 61.1                      | 0.7  | 36.2  | 2    | 0.4                            | 94   | 5.6   | 0    | 57.1                      | 0    | 42.9  | 0    |            |
| Total %     | 2                              | 49.9 | 0.1   | 0.1  | 2.5                       | 0    | 1.5   | 0.1  | 0.2                            | 40.9 | 2.4   | 0    | 0.2                       | 0    | 0.1   | 0    |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

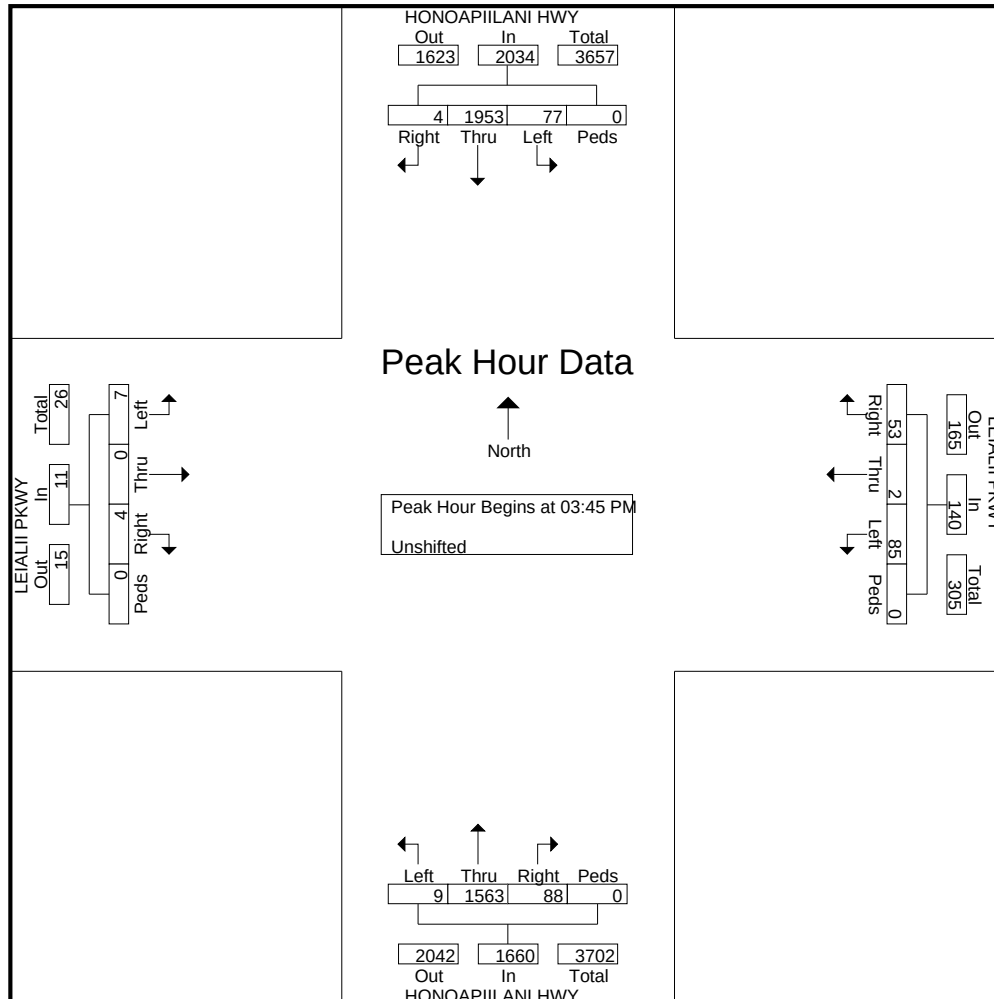
File Name : PM\_Honoapiilani Hwy - Leialii Pkwy

Site Code : 00000000

Start Date : 12/6/2016

Page No : 2

|                                                                   | HONOAPIILANI HWY<br>Southbound |      |       |      |            | LEIALII PKWY<br>Westbound |      |       |      |            | HONOAPIILANI HWY<br>Northbound |      |       |      |            | LEIALII PKWY<br>Eastbound |      |       |      |            |            |
|-------------------------------------------------------------------|--------------------------------|------|-------|------|------------|---------------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|---------------------------|------|-------|------|------------|------------|
| Start Time                                                        | Left                           | Thru | Right | Peds | App. Total | Left                      | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Left                      | Thru | Right | Peds | App. Total | Int. Total |
| <b>Peak Hour Analysis From 03:45 PM to 04:30 PM - Peak 1 of 1</b> |                                |      |       |      |            |                           |      |       |      |            |                                |      |       |      |            |                           |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 03:45 PM              |                                |      |       |      |            |                           |      |       |      |            |                                |      |       |      |            |                           |      |       |      |            |            |
| 03:45 PM                                                          | 15                             | 441  | 2     | 0    | 458        | 20                        | 0    | 14    | 0    | 34         | 2                              | 420  | 21    | 0    | 443        | 2                         | 0    | 0     | 0    | 2          | 937        |
| 04:00 PM                                                          | 23                             | 490  | 1     | 0    | 514        | 20                        | 0    | 18    | 0    | 38         | 2                              | 414  | 22    | 0    | 438        | 3                         | 0    | 1     | 0    | 4          | 994        |
| 04:15 PM                                                          | 22                             | 521  | 1     | 0    | 544        | 22                        | 1    | 7     | 0    | 30         | 4                              | 355  | 24    | 0    | 383        | 0                         | 0    | 2     | 0    | 2          | 959        |
| 04:30 PM                                                          | 17                             | 501  | 0     | 0    | 518        | 23                        | 1    | 14    | 0    | 38         | 1                              | 374  | 21    | 0    | 396        | 2                         | 0    | 1     | 0    | 3          | 955        |
| Total Volume                                                      | 77                             | 1953 | 4     | 0    | 2034       | 85                        | 2    | 53    | 0    | 140        | 9                              | 1563 | 88    | 0    | 1660       | 7                         | 0    | 4     | 0    | 11         | 3845       |
| % App. Total                                                      | 3.8                            | 96   | 0.2   | 0    |            | 60.7                      | 1.4  | 37.9  | 0    |            | 0.5                            | 94.2 | 5.3   | 0    |            | 63.6                      | 0    | 36.4  | 0    |            |            |
| PHF                                                               | .837                           | .937 | .500  | .000 | .935       | .924                      | .500 | .736  | .000 | .921       | .563                           | .930 | .917  | .000 | .937       | .583                      | .000 | .500  | .000 | .688       | .967       |



# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : PM\_Honoapiilani Hwy - Front St

Site Code : 00000000

Start Date : 12/6/2016

Page No : 1

## Groups Printed- Unshifted

|             | HONOAPIILANI HWY<br>Southbound |      |       |      | FRONT ST<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |      | FRONT ST<br>Eastbound |      |       |      |            |
|-------------|--------------------------------|------|-------|------|-----------------------|------|-------|------|--------------------------------|------|-------|------|-----------------------|------|-------|------|------------|
| Start Time  | Left                           | Thru | Right | Peds | Left                  | Thru | Right | Peds | Left                           | Thru | Right | Peds | Left                  | Thru | Right | Peds | Int. Total |
| 03:00 PM    | 0                              | 340  | 58    | 0    | 27                    | 2    | 1     | 0    | 0                              | 381  | 7     | 0    | 51                    | 1    | 0     | 0    | 868        |
| 03:15 PM    | 1                              | 371  | 56    | 0    | 14                    | 2    | 1     | 0    | 3                              | 395  | 3     | 0    | 32                    | 1    | 2     | 0    | 881        |
| 03:30 PM    | 2                              | 412  | 51    | 0    | 18                    | 3    | 1     | 0    | 1                              | 394  | 2     | 0    | 47                    | 2    | 1     | 0    | 934        |
| 03:45 PM    | 0                              | 388  | 74    | 0    | 9                     | 1    | 1     | 0    | 2                              | 368  | 3     | 0    | 43                    | 5    | 4     | 0    | 898        |
| Total       | 3                              | 1511 | 239   | 0    | 68                    | 8    | 4     | 0    | 6                              | 1538 | 15    | 0    | 173                   | 9    | 7     | 0    | 3581       |
| 04:00 PM    | 1                              | 391  | 62    | 0    | 7                     | 1    | 0     | 0    | 0                              | 428  | 5     | 0    | 37                    | 1    | 3     | 0    | 936        |
| 04:15 PM    | 0                              | 450  | 76    | 0    | 24                    | 1    | 2     | 0    | 0                              | 363  | 5     | 0    | 44                    | 3    | 1     | 0    | 969        |
| 04:30 PM    | 1                              | 417  | 81    | 0    | 19                    | 2    | 4     | 1    | 3                              | 345  | 7     | 0    | 36                    | 2    | 0     | 0    | 918        |
| 04:45 PM    | 2                              | 353  | 86    | 0    | 15                    | 3    | 3     | 0    | 7                              | 324  | 5     | 0    | 27                    | 0    | 0     | 0    | 825        |
| Total       | 4                              | 1611 | 305   | 0    | 65                    | 7    | 9     | 1    | 10                             | 1460 | 22    | 0    | 144                   | 6    | 4     | 0    | 3648       |
| Grand Total | 7                              | 3122 | 544   | 0    | 133                   | 15   | 13    | 1    | 16                             | 2998 | 37    | 0    | 317                   | 15   | 11    | 0    | 7229       |
| Apprch %    | 0.2                            | 85   | 14.8  | 0    | 82.1                  | 9.3  | 8     | 0.6  | 0.5                            | 98.3 | 1.2   | 0    | 92.4                  | 4.4  | 3.2   | 0    |            |
| Total %     | 0.1                            | 43.2 | 7.5   | 0    | 1.8                   | 0.2  | 0.2   | 0    | 0.2                            | 41.5 | 0.5   | 0    | 4.4                   | 0.2  | 0.2   | 0    |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

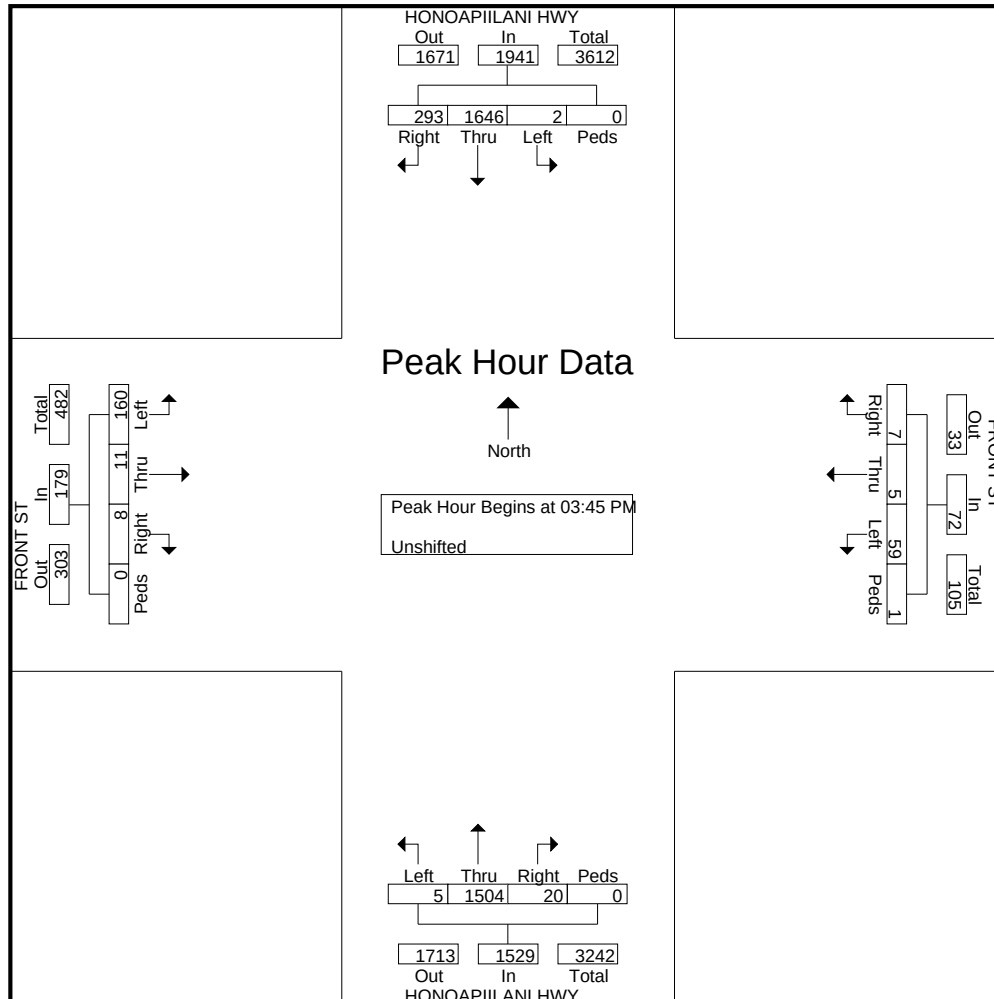
File Name : PM\_Honoapiilani Hwy - Front St

Site Code : 00000000

Start Date : 12/6/2016

Page No : 2

|                                                                   | HONOAPIILANI HWY<br>Southbound |      |       |      |            | FRONT ST<br>Westbound |      |       |      |            | HONOAPIILANI HWY<br>Northbound |      |       |      |            | FRONT ST<br>Eastbound |      |       |      |            |            |
|-------------------------------------------------------------------|--------------------------------|------|-------|------|------------|-----------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|-----------------------|------|-------|------|------------|------------|
| Start Time                                                        | Left                           | Thru | Right | Peds | App. Total | Left                  | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Left                  | Thru | Right | Peds | App. Total | Int. Total |
| <b>Peak Hour Analysis From 03:45 PM to 04:30 PM - Peak 1 of 1</b> |                                |      |       |      |            |                       |      |       |      |            |                                |      |       |      |            |                       |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 03:45 PM              |                                |      |       |      |            |                       |      |       |      |            |                                |      |       |      |            |                       |      |       |      |            |            |
| 03:45 PM                                                          | 0                              | 388  | 74    | 0    | 462        | 9                     | 1    | 1     | 0    | 11         | 2                              | 368  | 3     | 0    | 373        | 43                    | 5    | 4     | 0    | 52         | 898        |
| 04:00 PM                                                          | 1                              | 391  | 62    | 0    | 454        | 7                     | 1    | 0     | 0    | 8          | 0                              | 428  | 5     | 0    | 433        | 37                    | 1    | 3     | 0    | 41         | 936        |
| 04:15 PM                                                          | 0                              | 450  | 76    | 0    | 526        | 24                    | 1    | 2     | 0    | 27         | 0                              | 363  | 5     | 0    | 368        | 44                    | 3    | 1     | 0    | 48         | 969        |
| 04:30 PM                                                          | 1                              | 417  | 81    | 0    | 499        | 19                    | 2    | 4     | 1    | 26         | 3                              | 345  | 7     | 0    | 355        | 36                    | 2    | 0     | 0    | 38         | 918        |
| Total Volume                                                      | 2                              | 1646 | 293   | 0    | 1941       | 59                    | 5    | 7     | 1    | 72         | 5                              | 1504 | 20    | 0    | 1529       | 160                   | 11   | 8     | 0    | 179        | 3721       |
| % App. Total                                                      | 0.1                            | 84.8 | 15.1  | 0    |            | 81.9                  | 6.9  | 9.7   | 1.4  |            | 0.3                            | 98.4 | 1.3   | 0    |            | 89.4                  | 6.1  | 4.5   | 0    |            |            |
| PHF                                                               | .500                           | .914 | .904  | .000 | .923       | .615                  | .625 | .438  | .250 | .667       | .417                           | .879 | .714  | .000 | .883       | .909                  | .550 | .500  | .000 | .861       | .960       |



# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : PM\_Honoapiilani Hwy-Kapunakea St

Site Code : 00000000

Start Date : 12/6/2016

Page No : 1

Groups Printed- Unshifted

|             | KAPUNAKEA ST<br>Eastbound |      |       |      | KAPUNAKEA ST<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |      | HONOAPIILANI HWY<br>Southbound |      |       |      |            |
|-------------|---------------------------|------|-------|------|---------------------------|------|-------|------|--------------------------------|------|-------|------|--------------------------------|------|-------|------|------------|
| Start Time  | Left                      | Thru | Right | Peds | Left                      | Thru | Right | Peds | Left                           | Thru | Right | Peds | Left                           | Thru | Right | Peds | Int. Total |
| 03:00 PM    | 44                        | 7    | 12    | 0    | 30                        | 6    | 5     | 0    | 8                              | 351  | 27    | 0    | 1                              | 358  | 24    | 5    | 878        |
| 03:15 PM    | 35                        | 9    | 13    | 1    | 21                        | 4    | 3     | 0    | 10                             | 334  | 25    | 0    | 6                              | 404  | 18    | 2    | 885        |
| 03:30 PM    | 37                        | 4    | 15    | 1    | 32                        | 6    | 2     | 0    | 12                             | 345  | 28    | 0    | 3                              | 354  | 36    | 5    | 880        |
| 03:45 PM    | 28                        | 8    | 9     | 1    | 21                        | 8    | 6     | 0    | 16                             | 361  | 28    | 0    | 3                              | 405  | 29    | 0    | 923        |
| Total       | 144                       | 28   | 49    | 3    | 104                       | 24   | 16    | 0    | 46                             | 1391 | 108   | 0    | 13                             | 1521 | 107   | 12   | 3566       |
| 04:00 PM    | 36                        | 12   | 10    | 0    | 26                        | 3    | 3     | 1    | 8                              | 357  | 26    | 0    | 7                              | 357  | 29    | 3    | 878        |
| 04:15 PM    | 36                        | 8    | 11    | 1    | 17                        | 5    | 2     | 1    | 13                             | 313  | 16    | 0    | 9                              | 398  | 39    | 8    | 877        |
| 04:30 PM    | 38                        | 7    | 14    | 2    | 27                        | 7    | 6     | 0    | 14                             | 321  | 33    | 0    | 4                              | 436  | 39    | 5    | 953        |
| 04:45 PM    | 31                        | 4    | 11    | 0    | 25                        | 8    | 1     | 0    | 13                             | 312  | 21    | 0    | 4                              | 361  | 34    | 0    | 825        |
| Total       | 141                       | 31   | 46    | 3    | 95                        | 23   | 12    | 2    | 48                             | 1303 | 96    | 0    | 24                             | 1552 | 141   | 16   | 3533       |
| Grand Total | 285                       | 59   | 95    | 6    | 199                       | 47   | 28    | 2    | 94                             | 2694 | 204   | 0    | 37                             | 3073 | 248   | 28   | 7099       |
| Apprch %    | 64                        | 13.3 | 21.3  | 1.3  | 72.1                      | 17   | 10.1  | 0.7  | 3.1                            | 90   | 6.8   | 0    | 1.1                            | 90.8 | 7.3   | 0.8  |            |
| Total %     | 4                         | 0.8  | 1.3   | 0.1  | 2.8                       | 0.7  | 0.4   | 0    | 1.3                            | 37.9 | 2.9   | 0    | 0.5                            | 43.3 | 3.5   | 0.4  |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

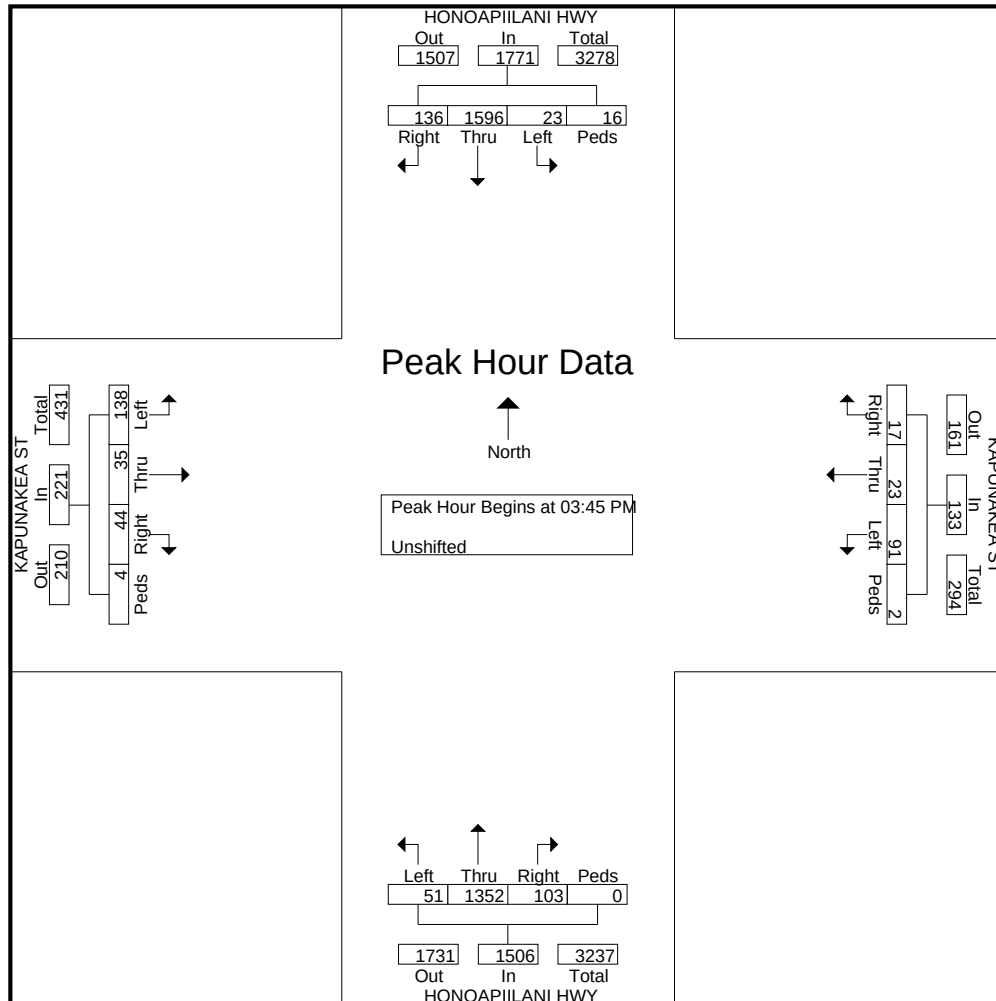
File Name : PM\_Honoapiilani Hwy-Kapunakea St

Site Code : 00000000

Start Date : 12/6/2016

Page No : 2

|                                                            | KAPUNAKEA ST<br>Eastbound |      |       |      |            | KAPUNAKEA ST<br>Westbound |      |       |      |            | HONOAPIILANI HWY<br>Northbound |      |       |      |            | HONOAPIILANI HWY<br>Southbound |      |       |      |            |            |
|------------------------------------------------------------|---------------------------|------|-------|------|------------|---------------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|------------|
| Start Time                                                 | Left                      | Thru | Right | Peds | App. Total | Left                      | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Int. Total |
| Peak Hour Analysis From 03:45 PM to 04:30 PM - Peak 1 of 1 |                           |      |       |      |            |                           |      |       |      |            |                                |      |       |      |            |                                |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 03:45 PM       |                           |      |       |      |            |                           |      |       |      |            |                                |      |       |      |            |                                |      |       |      |            |            |
| 03:45 PM                                                   | 28                        | 8    | 9     | 1    | 46         | 21                        | 8    | 6     | 0    | 35         | 16                             | 361  | 28    | 0    | 405        | 3                              | 405  | 29    | 0    | 437        | 923        |
| 04:00 PM                                                   | 36                        | 12   | 10    | 0    | 58         | 26                        | 3    | 3     | 1    | 33         | 8                              | 357  | 26    | 0    | 391        | 7                              | 357  | 29    | 3    | 396        | 878        |
| 04:15 PM                                                   | 36                        | 8    | 11    | 1    | 56         | 17                        | 5    | 2     | 1    | 25         | 13                             | 313  | 16    | 0    | 342        | 9                              | 398  | 39    | 8    | 454        | 877        |
| 04:30 PM                                                   | 38                        | 7    | 14    | 2    | 61         | 27                        | 7    | 6     | 0    | 40         | 14                             | 321  | 33    | 0    | 368        | 4                              | 436  | 39    | 5    | 484        | 953        |
| Total Volume                                               | 138                       | 35   | 44    | 4    | 221        | 91                        | 23   | 17    | 2    | 133        | 51                             | 1352 | 103   | 0    | 1506       | 23                             | 1596 | 136   | 16   | 1771       | 3631       |
| % App. Total                                               | 62.4                      | 15.8 | 19.9  | 1.8  |            | 68.4                      | 17.3 | 12.8  | 1.5  |            | 3.4                            | 89.8 | 6.8   | 0    |            | 1.3                            | 90.1 | 7.7   | 0.9  |            |            |
| PHF                                                        | .908                      | .729 | .786  | .500 | .906       | .843                      | .719 | .708  | .500 | .831       | .797                           | .936 | .780  | .000 | .930       | .639                           | .915 | .872  | .500 | .915       | .953       |



# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : PM\_Honoapiilani Hwy-Keawe St

Site Code : 00000000

Start Date : 12/6/2016

Page No : 1

Groups Printed- Unshifted

|             | KEAWE ST<br>Eastbound |      |       |      | KEAWE ST<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |      | HONOAPIILANI HWY<br>Southbound |      |       |      |            |
|-------------|-----------------------|------|-------|------|-----------------------|------|-------|------|--------------------------------|------|-------|------|--------------------------------|------|-------|------|------------|
| Start Time  | Left                  | Thru | Right | Peds | Left                  | Thru | Right | Peds | Left                           | Thru | Right | Peds | Left                           | Thru | Right | Peds | Int. Total |
| 03:00 PM    | 10                    | 26   | 19    | 1    | 37                    | 22   | 116   | 2    | 20                             | 251  | 55    | 5    | 77                             | 279  | 11    | 1    | 932        |
| 03:15 PM    | 21                    | 34   | 21    | 1    | 41                    | 17   | 108   | 4    | 22                             | 222  | 48    | 3    | 94                             | 285  | 15    | 4    | 940        |
| 03:30 PM    | 19                    | 34   | 26    | 3    | 39                    | 20   | 112   | 1    | 23                             | 261  | 58    | 1    | 88                             | 282  | 16    | 11   | 994        |
| 03:45 PM    | 9                     | 39   | 13    | 1    | 49                    | 18   | 90    | 1    | 19                             | 301  | 60    | 1    | 107                            | 329  | 10    | 1    | 1048       |
| Total       | 59                    | 133  | 79    | 6    | 166                   | 77   | 426   | 8    | 84                             | 1035 | 221   | 10   | 366                            | 1175 | 52    | 17   | 3914       |
| 04:00 PM    | 17                    | 47   | 27    | 3    | 41                    | 19   | 122   | 0    | 22                             | 263  | 61    | 2    | 94                             | 271  | 17    | 2    | 1008       |
| 04:15 PM    | 14                    | 42   | 15    | 5    | 33                    | 23   | 102   | 3    | 17                             | 244  | 80    | 6    | 85                             | 309  | 11    | 8    | 997        |
| 04:30 PM    | 14                    | 32   | 25    | 1    | 39                    | 25   | 106   | 2    | 18                             | 240  | 53    | 3    | 95                             | 329  | 20    | 7    | 1009       |
| 04:45 PM    | 6                     | 17   | 11    | 0    | 22                    | 11   | 55    | 1    | 16                             | 137  | 43    | 2    | 61                             | 184  | 11    | 0    | 577        |
| Total       | 51                    | 138  | 78    | 9    | 135                   | 78   | 385   | 6    | 73                             | 884  | 237   | 13   | 335                            | 1093 | 59    | 17   | 3591       |
| Grand Total | 110                   | 271  | 157   | 15   | 301                   | 155  | 811   | 14   | 157                            | 1919 | 458   | 23   | 701                            | 2268 | 111   | 34   | 7505       |
| Apprch %    | 19.9                  | 49   | 28.4  | 2.7  | 23.5                  | 12.1 | 63.3  | 1.1  | 6.1                            | 75   | 17.9  | 0.9  | 22.5                           | 72.8 | 3.6   | 1.1  |            |
| Total %     | 1.5                   | 3.6  | 2.1   | 0.2  | 4                     | 2.1  | 10.8  | 0.2  | 2.1                            | 25.6 | 6.1   | 0.3  | 9.3                            | 30.2 | 1.5   | 0.5  |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

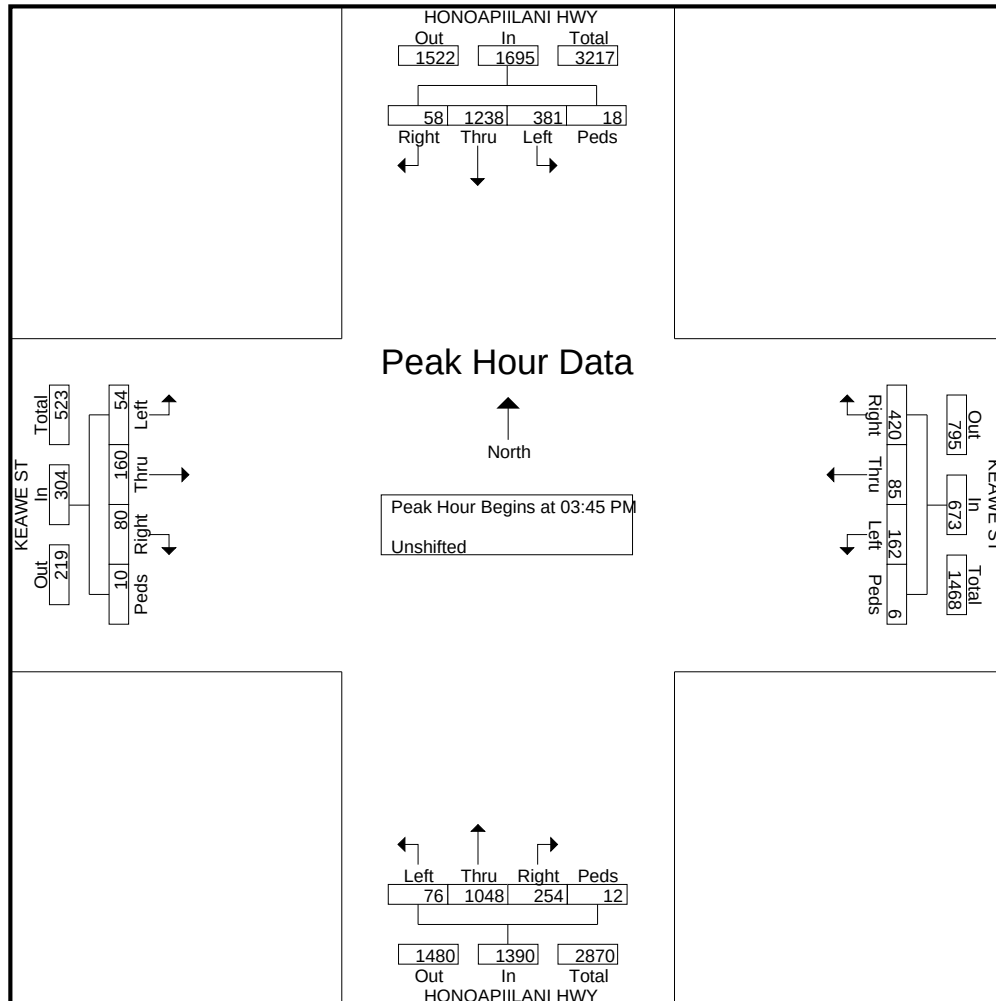
File Name : PM\_Honoapiilani Hwy-Keawe St

Site Code : 00000000

Start Date : 12/6/2016

Page No : 2

|                                                            | KEAWE ST<br>Eastbound |      |       |      |            | KEAWE ST<br>Westbound |      |       |      |            | HONOAPIILANI HWY<br>Northbound |      |       |      |            | HONOAPIILANI HWY<br>Southbound |      |       |      |            |            |
|------------------------------------------------------------|-----------------------|------|-------|------|------------|-----------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|------------|
| Start Time                                                 | Left                  | Thru | Right | Peds | App. Total | Left                  | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Int. Total |
| Peak Hour Analysis From 03:45 PM to 04:30 PM - Peak 1 of 1 |                       |      |       |      |            |                       |      |       |      |            |                                |      |       |      |            |                                |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 03:45 PM       |                       |      |       |      |            |                       |      |       |      |            |                                |      |       |      |            |                                |      |       |      |            |            |
| 03:45 PM                                                   | 9                     | 39   | 13    | 1    | 62         | 49                    | 18   | 90    | 1    | 158        | 19                             | 301  | 60    | 1    | 381        | 107                            | 329  | 10    | 1    | 447        | 1048       |
| 04:00 PM                                                   | 17                    | 47   | 27    | 3    | 94         | 41                    | 19   | 122   | 0    | 182        | 22                             | 263  | 61    | 2    | 348        | 94                             | 271  | 17    | 2    | 384        | 1008       |
| 04:15 PM                                                   | 14                    | 42   | 15    | 5    | 76         | 33                    | 23   | 102   | 3    | 161        | 17                             | 244  | 80    | 6    | 347        | 85                             | 309  | 11    | 8    | 413        | 997        |
| 04:30 PM                                                   | 14                    | 32   | 25    | 1    | 72         | 39                    | 25   | 106   | 2    | 172        | 18                             | 240  | 53    | 3    | 314        | 95                             | 329  | 20    | 7    | 451        | 1009       |
| Total Volume                                               | 54                    | 160  | 80    | 10   | 304        | 162                   | 85   | 420   | 6    | 673        | 76                             | 1048 | 254   | 12   | 1390       | 381                            | 1238 | 58    | 18   | 1695       | 4062       |
| % App. Total                                               | 17.8                  | 52.6 | 26.3  | 3.3  |            | 24.1                  | 12.6 | 62.4  | 0.9  |            | 5.5                            | 75.4 | 18.3  | 0.9  |            | 22.5                           | 73   | 3.4   | 1.1  |            |            |
| PHF                                                        | .794                  | .851 | .741  | .500 | .809       | .827                  | .850 | .861  | .500 | .924       | .864                           | .870 | .794  | .500 | .912       | .890                           | .941 | .725  | .563 | .940       | .969       |





# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : WE\_Honoapiilani Hwy - Napili Hau St

Site Code : 00000000

Start Date : 1/21/2017

Page No : 1

## Groups Printed- Unshifted

|             | HONOAPIILANI HWY<br>Southbound |      |       |      | NAPILHAU ST<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |      | NAPILHAU ST<br>Eastbound |      |       |      |            |
|-------------|--------------------------------|------|-------|------|--------------------------|------|-------|------|--------------------------------|------|-------|------|--------------------------|------|-------|------|------------|
| Start Time  | Left                           | Thru | Right | Peds | Left                     | Thru | Right | Peds | Left                           | Thru | Right | Peds | Left                     | Thru | Right | Peds | Int. Total |
| 11:00 AM    | 5                              | 67   | 13    | 4    | 10                       | 10   | 1     | 0    | 60                             | 79   | 14    | 0    | 18                       | 4    | 88    | 1    | 374        |
| 11:15 AM    | 2                              | 47   | 24    | 1    | 6                        | 5    | 2     | 0    | 60                             | 75   | 3     | 0    | 18                       | 4    | 81    | 2    | 330        |
| 11:30 AM    | 3                              | 55   | 13    | 1    | 6                        | 9    | 2     | 0    | 52                             | 79   | 10    | 0    | 14                       | 9    | 78    | 0    | 331        |
| 11:45 AM    | 4                              | 63   | 22    | 0    | 6                        | 4    | 5     | 1    | 69                             | 63   | 3     | 0    | 11                       | 5    | 87    | 1    | 344        |
| Total       | 14                             | 232  | 72    | 6    | 28                       | 28   | 10    | 1    | 241                            | 296  | 30    | 0    | 61                       | 22   | 334   | 4    | 1379       |
| 12:00 PM    | 2                              | 60   | 22    | 2    | 8                        | 6    | 1     | 1    | 78                             | 72   | 2     | 0    | 7                        | 5    | 73    | 0    | 339        |
| 12:15 PM    | 1                              | 73   | 30    | 0    | 5                        | 9    | 4     | 0    | 51                             | 62   | 4     | 0    | 7                        | 3    | 67    | 0    | 316        |
| 12:30 PM    | 0                              | 58   | 19    | 0    | 4                        | 2    | 1     | 0    | 59                             | 62   | 4     | 0    | 13                       | 3    | 71    | 0    | 296        |
| 12:45 PM    | 0                              | 71   | 13    | 0    | 2                        | 4    | 0     | 0    | 70                             | 71   | 4     | 0    | 11                       | 3    | 56    | 0    | 305        |
| Total       | 3                              | 262  | 84    | 2    | 19                       | 21   | 6     | 1    | 258                            | 267  | 14    | 0    | 38                       | 14   | 267   | 0    | 1256       |
| Grand Total | 17                             | 494  | 156   | 8    | 47                       | 49   | 16    | 2    | 499                            | 563  | 44    | 0    | 99                       | 36   | 601   | 4    | 2635       |
| Apprch %    | 2.5                            | 73.2 | 23.1  | 1.2  | 41.2                     | 43   | 14    | 1.8  | 45.1                           | 50.9 | 4     | 0    | 13.4                     | 4.9  | 81.2  | 0.5  |            |
| Total %     | 0.6                            | 18.7 | 5.9   | 0.3  | 1.8                      | 1.9  | 0.6   | 0.1  | 18.9                           | 21.4 | 1.7   | 0    | 3.8                      | 1.4  | 22.8  | 0.2  |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

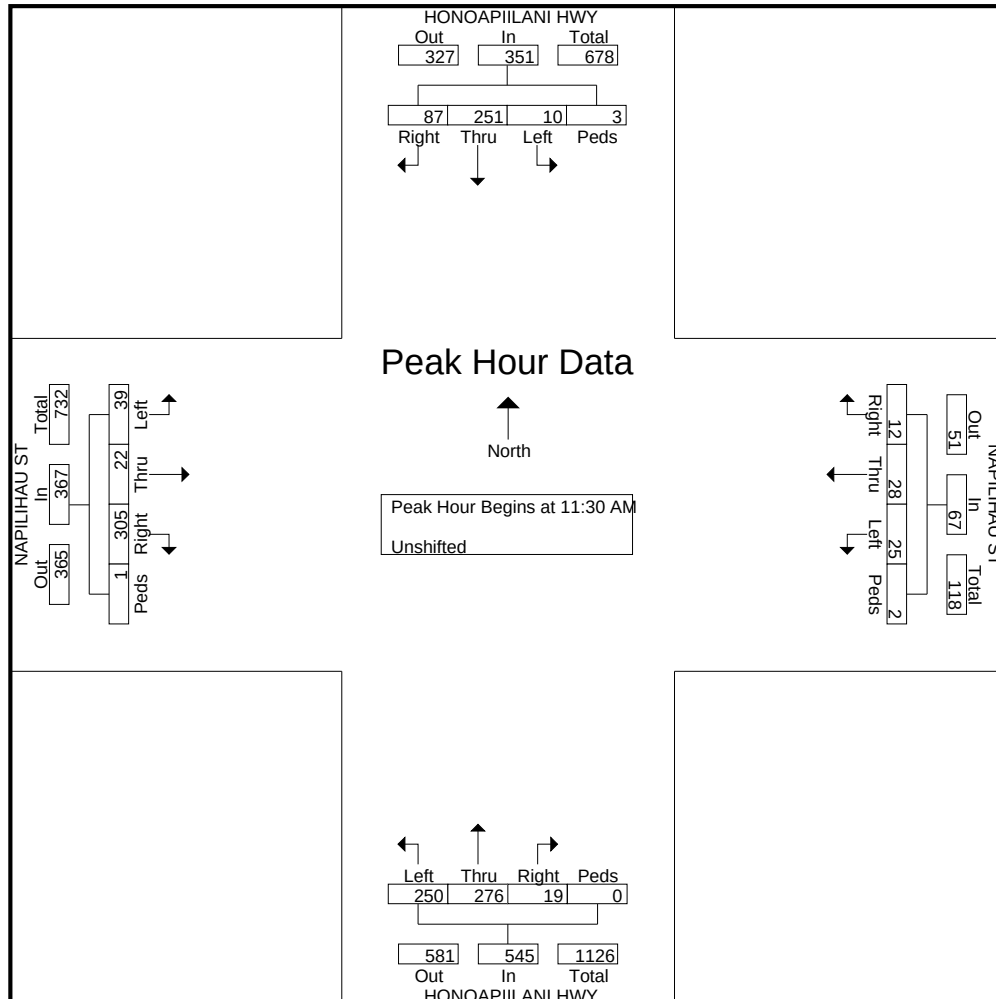
File Name : WE\_Honoapiilani Hwy - Napilihau St

Site Code : 00000000

Start Date : 1/21/2017

Page No : 2

|                                                                   | HONOAPIILANI HWY<br>Southbound |           |           |          |            | NAPILIHAW ST<br>Westbound |          |          |          |            | HONOAPIILANI HWY<br>Northbound |           |           |      |            | NAPILIHAW ST<br>Eastbound |          |           |          |            |            |
|-------------------------------------------------------------------|--------------------------------|-----------|-----------|----------|------------|---------------------------|----------|----------|----------|------------|--------------------------------|-----------|-----------|------|------------|---------------------------|----------|-----------|----------|------------|------------|
| Start Time                                                        | Left                           | Thru      | Right     | Peds     | App. Total | Left                      | Thru     | Right    | Peds     | App. Total | Left                           | Thru      | Right     | Peds | App. Total | Left                      | Thru     | Right     | Peds     | App. Total | Int. Total |
| <b>Peak Hour Analysis From 11:30 AM to 12:15 PM - Peak 1 of 1</b> |                                |           |           |          |            |                           |          |          |          |            |                                |           |           |      |            |                           |          |           |          |            |            |
| Peak Hour for Entire Intersection Begins at 11:30 AM              |                                |           |           |          |            |                           |          |          |          |            |                                |           |           |      |            |                           |          |           |          |            |            |
| 11:30 AM                                                          | 3                              | 55        | 13        | 1        | 72         | 6                         | <b>9</b> | 2        | 0        | 17         | 52                             | <b>79</b> | <b>10</b> | 0    | 141        | <b>14</b>                 | <b>9</b> | 78        | 0        | 101        | 331        |
| 11:45 AM                                                          | <b>4</b>                       | 63        | 22        | 0        | 89         | 6                         | 4        | <b>5</b> | <b>1</b> | 16         | 69                             | 63        | 3         | 0    | 135        | 11                        | 5        | <b>87</b> | <b>1</b> | <b>104</b> | <b>344</b> |
| 12:00 PM                                                          | 2                              | 60        | 22        | <b>2</b> | 86         | <b>8</b>                  | 6        | 1        | 1        | 16         | <b>78</b>                      | 72        | 2         | 0    | <b>152</b> | 7                         | 5        | 73        | 0        | 85         | 339        |
| 12:15 PM                                                          | 1                              | <b>73</b> | <b>30</b> | 0        | <b>104</b> | 5                         | 9        | 4        | 0        | <b>18</b>  | 51                             | 62        | 4         | 0    | 117        | 7                         | 3        | 67        | 0        | 77         | 316        |
| Total Volume                                                      | 10                             | 251       | 87        | 3        | 351        | 25                        | 28       | 12       | 2        | 67         | 250                            | 276       | 19        | 0    | 545        | 39                        | 22       | 305       | 1        | 367        | 1330       |
| % App. Total                                                      | 2.8                            | 71.5      | 24.8      | 0.9      |            | 37.3                      | 41.8     | 17.9     | 3        |            | 45.9                           | 50.6      | 3.5       | 0    |            | 10.6                      | 6        | 83.1      | 0.3      |            |            |
| PHF                                                               | .625                           | .860      | .725      | .375     | .844       | .781                      | .778     | .600     | .500     | .931       | .801                           | .873      | .475      | .000 | .896       | .696                      | .611     | .876      | .250     | .882       | .967       |



# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : WE\_Honoapiilani Hwy - Hoohui Rd

Site Code : 00000000

Start Date : 12/10/2016

Page No : 1

## Groups Printed- Unshifted

|             | HONOAPIILANI HWY<br>Southbound |      |       |      | HOOHUI RD<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |      | HOOHUI RD<br>Eastbound |      |       |      |            |
|-------------|--------------------------------|------|-------|------|------------------------|------|-------|------|--------------------------------|------|-------|------|------------------------|------|-------|------|------------|
| Start Time  | Left                           | Thru | Right | Peds | Left                   | Thru | Right | Peds | Left                           | Thru | Right | Peds | Left                   | Thru | Right | Peds | Int. Total |
| 11:00 AM    | 2                              | 93   | 13    | 0    | 9                      | 5    | 2     | 0    | 18                             | 77   | 6     | 0    | 8                      | 6    | 35    | 0    | 274        |
| 11:15 AM    | 0                              | 101  | 22    | 3    | 5                      | 2    | 2     | 2    | 23                             | 83   | 2     | 0    | 13                     | 2    | 33    | 0    | 293        |
| 11:30 AM    | 3                              | 111  | 12    | 3    | 14                     | 4    | 0     | 2    | 24                             | 80   | 4     | 0    | 10                     | 1    | 52    | 0    | 320        |
| 11:45 AM    | 2                              | 101  | 15    | 1    | 7                      | 0    | 2     | 0    | 25                             | 76   | 6     | 0    | 14                     | 6    | 38    | 0    | 293        |
| Total       | 7                              | 406  | 62    | 7    | 35                     | 11   | 6     | 4    | 90                             | 316  | 18    | 0    | 45                     | 15   | 158   | 0    | 1180       |
| 12:00 PM    | 4                              | 103  | 14    | 0    | 5                      | 7    | 3     | 0    | 41                             | 108  | 6     | 0    | 12                     | 5    | 45    | 0    | 353        |
| 12:15 PM    | 3                              | 99   | 14    | 1    | 9                      | 4    | 0     | 1    | 28                             | 111  | 6     | 0    | 16                     | 4    | 41    | 0    | 337        |
| 12:30 PM    | 3                              | 95   | 20    | 1    | 7                      | 1    | 2     | 0    | 25                             | 112  | 6     | 0    | 15                     | 1    | 33    | 0    | 321        |
| 12:45 PM    | 7                              | 95   | 14    | 0    | 8                      | 1    | 4     | 1    | 40                             | 120  | 4     | 0    | 11                     | 1    | 29    | 0    | 335        |
| Total       | 17                             | 392  | 62    | 2    | 29                     | 13   | 9     | 2    | 134                            | 451  | 22    | 0    | 54                     | 11   | 148   | 0    | 1346       |
| Grand Total | 24                             | 798  | 124   | 9    | 64                     | 24   | 15    | 6    | 224                            | 767  | 40    | 0    | 99                     | 26   | 306   | 0    | 2526       |
| Apprch %    | 2.5                            | 83.6 | 13    | 0.9  | 58.7                   | 22   | 13.8  | 5.5  | 21.7                           | 74.4 | 3.9   | 0    | 23                     | 6    | 71    | 0    |            |
| Total %     | 1                              | 31.6 | 4.9   | 0.4  | 2.5                    | 1    | 0.6   | 0.2  | 8.9                            | 30.4 | 1.6   | 0    | 3.9                    | 1    | 12.1  | 0    |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

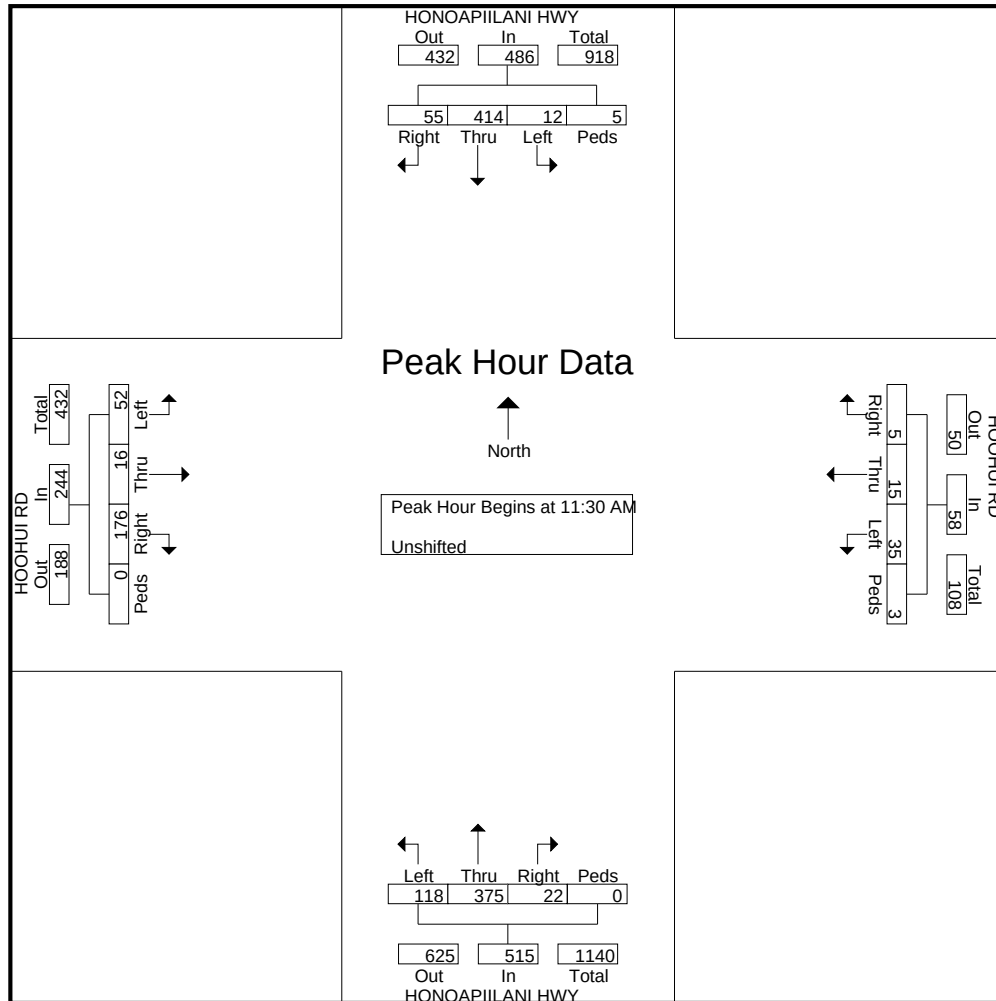
File Name : WE\_Honoapiilani Hwy - Hoohui Rd

Site Code : 00000000

Start Date : 12/10/2016

Page No : 2

|                                                                   | HONOAPIILANI HWY<br>Southbound |      |       |      |            | HOOHUI RD<br>Westbound |      |       |      |            | HONOAPIILANI HWY<br>Northbound |      |       |      |            | HOOHUI RD<br>Eastbound |      |       |      |            |            |
|-------------------------------------------------------------------|--------------------------------|------|-------|------|------------|------------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|------------------------|------|-------|------|------------|------------|
| Start Time                                                        | Left                           | Thru | Right | Peds | App. Total | Left                   | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Left                   | Thru | Right | Peds | App. Total | Int. Total |
| <b>Peak Hour Analysis From 11:30 AM to 12:15 PM - Peak 1 of 1</b> |                                |      |       |      |            |                        |      |       |      |            |                                |      |       |      |            |                        |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 11:30 AM              |                                |      |       |      |            |                        |      |       |      |            |                                |      |       |      |            |                        |      |       |      |            |            |
| 11:30 AM                                                          | 3                              | 111  | 12    | 3    | 129        | 14                     | 4    | 0     | 2    | 20         | 24                             | 80   | 4     | 0    | 108        | 10                     | 1    | 52    | 0    | 63         | 320        |
| 11:45 AM                                                          | 2                              | 101  | 15    | 1    | 119        | 7                      | 0    | 2     | 0    | 9          | 25                             | 76   | 6     | 0    | 107        | 14                     | 6    | 38    | 0    | 58         | 293        |
| 12:00 PM                                                          | 4                              | 103  | 14    | 0    | 121        | 5                      | 7    | 3     | 0    | 15         | 41                             | 108  | 6     | 0    | 155        | 12                     | 5    | 45    | 0    | 62         | 353        |
| 12:15 PM                                                          | 3                              | 99   | 14    | 1    | 117        | 9                      | 4    | 0     | 1    | 14         | 28                             | 111  | 6     | 0    | 145        | 16                     | 4    | 41    | 0    | 61         | 337        |
| Total Volume                                                      | 12                             | 414  | 55    | 5    | 486        | 35                     | 15   | 5     | 3    | 58         | 118                            | 375  | 22    | 0    | 515        | 52                     | 16   | 176   | 0    | 244        | 1303       |
| % App. Total                                                      | 2.5                            | 85.2 | 11.3  | 1    |            | 60.3                   | 25.9 | 8.6   | 5.2  |            | 22.9                           | 72.8 | 4.3   | 0    |            | 21.3                   | 6.6  | 72.1  | 0    |            |            |
| PHF                                                               | .750                           | .932 | .917  | .417 | .942       | .625                   | .536 | .417  | .375 | .725       | .720                           | .845 | .917  | .000 | .831       | .813                   | .667 | .846  | .000 | .968       | .923       |



# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : WE\_Honnoapiilani Hwy - Akahele St

Site Code : 00000000

Start Date : 12/10/2016

Page No : 1

**Groups Printed- Unshifted - Bank 1**

[illegible]

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

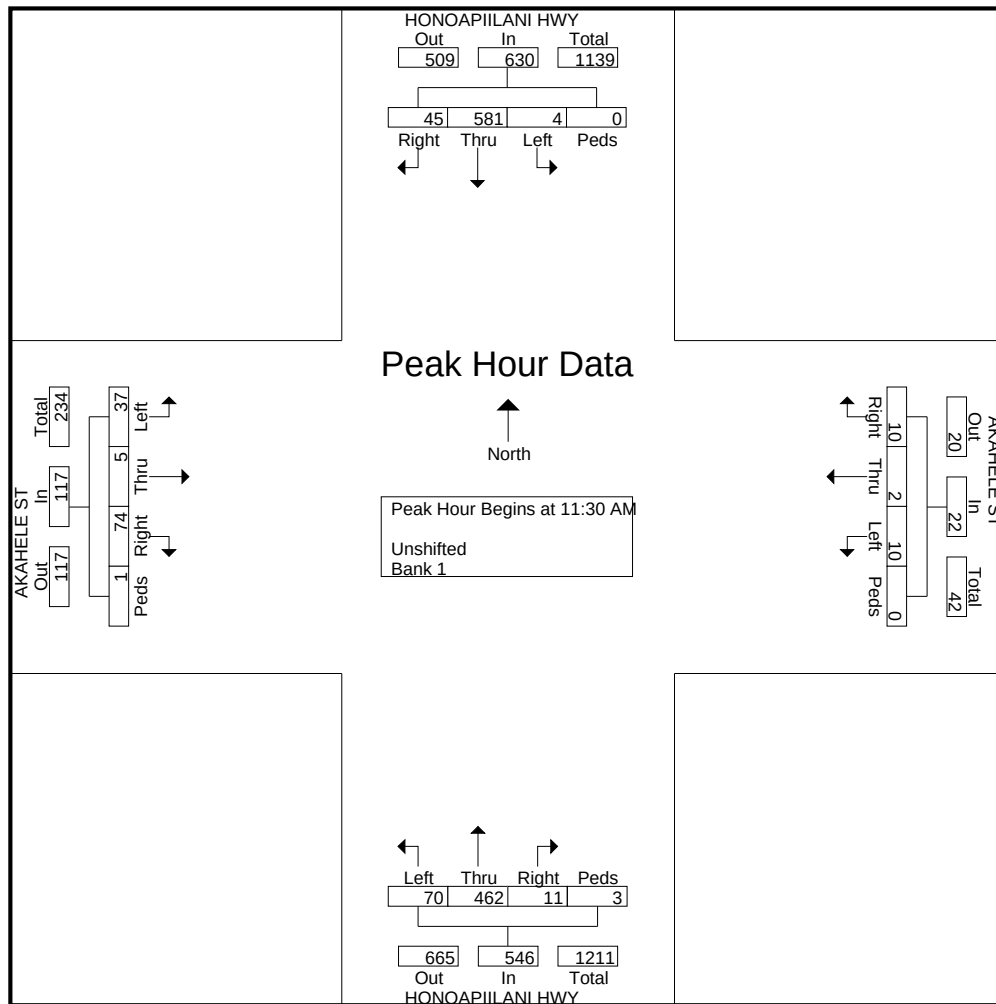
File Name : WE\_Honnoapiilani Hwy - Akahele St

Site Code : 00000000

Start Date : 12/10/2016

Page No : 2

|                                                            | HONOAPIILANI HWY<br>Southbound |      |       |      |            | AKAHELE ST<br>Westbound |      |       |      |            | HONOAPIILANI HWY<br>Northbound |      |       |      |            | AKAHELE ST<br>Eastbound |      |       |      |            |            |
|------------------------------------------------------------|--------------------------------|------|-------|------|------------|-------------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|-------------------------|------|-------|------|------------|------------|
| Start Time                                                 | Left                           | Thru | Right | Peds | App. Total | Left                    | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Left                    | Thru | Right | Peds | App. Total | Int. Total |
| Peak Hour Analysis From 11:30 AM to 12:15 PM - Peak 1 of 1 |                                |      |       |      |            |                         |      |       |      |            |                                |      |       |      |            |                         |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 11:30 AM       |                                |      |       |      |            |                         |      |       |      |            |                                |      |       |      |            |                         |      |       |      |            |            |
| 11:30 AM                                                   | 2                              | 172  | 12    | 0    | 186        | 3                       | 0    | 3     | 0    | 6          | 20                             | 88   | 1     | 0    | 109        | 8                       | 0    | 25    | 0    | 33         | 334        |
| 11:45 AM                                                   | 1                              | 130  | 14    | 0    | 145        | 3                       | 0    | 1     | 0    | 4          | 15                             | 95   | 4     | 3    | 117        | 11                      | 2    | 14    | 0    | 27         | 293        |
| 12:00 PM                                                   | 1                              | 136  | 11    | 0    | 148        | 0                       | 0    | 5     | 0    | 5          | 21                             | 140  | 4     | 0    | 165        | 10                      | 2    | 16    | 0    | 28         | 346        |
| 12:15 PM                                                   | 0                              | 143  | 8     | 0    | 151        | 4                       | 2    | 1     | 0    | 7          | 14                             | 139  | 2     | 0    | 155        | 8                       | 1    | 19    | 1    | 29         | 342        |
| Total Volume                                               | 4                              | 581  | 45    | 0    | 630        | 10                      | 2    | 10    | 0    | 22         | 70                             | 462  | 11    | 3    | 546        | 37                      | 5    | 74    | 1    | 117        | 1315       |
| % App. Total                                               | 0.6                            | 92.2 | 7.1   | 0    |            | 45.5                    | 9.1  | 45.5  | 0    |            | 12.8                           | 84.6 | 2     | 0.5  |            | 31.6                    | 4.3  | 63.2  | 0.9  |            |            |
| PHF                                                        | .500                           | .844 | .804  | .000 | .847       | .625                    | .250 | .500  | .000 | .786       | .833                           | .825 | .688  | .250 | .827       | .841                    | .625 | .740  | .250 | .886       | .950       |



# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : WE\_Honoapiilani Hwy - Lower Honoapiilani Rd

Site Code : 00000000

Start Date : 12/10/2016

Page No : 1

Groups Printed- Unshifted

|             | HONOAPIILANI HWY<br>Southbound |      |       |      | LOWER HONOAPIILANI<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |      | LOWER HONOAPIILANI<br>Eastbound |      |       |      |            |
|-------------|--------------------------------|------|-------|------|---------------------------------|------|-------|------|--------------------------------|------|-------|------|---------------------------------|------|-------|------|------------|
| Start Time  | Left                           | Thru | Right | Peds | Left                            | Thru | Right | Peds | Left                           | Thru | Right | Peds | Left                            | Thru | Right | Peds | Int. Total |
| 11:00 AM    | 0                              | 135  | 20    | 0    | 0                               | 0    | 0     | 0    | 71                             | 100  | 0     | 0    | 11                              | 3    | 157   | 0    | 497        |
| 11:15 AM    | 0                              | 118  | 11    | 0    | 0                               | 0    | 0     | 0    | 76                             | 112  | 3     | 0    | 14                              | 24   | 133   | 0    | 491        |
| 11:30 AM    | 0                              | 164  | 14    | 1    | 2                               | 0    | 1     | 0    | 90                             | 89   | 2     | 0    | 10                              | 0    | 140   | 0    | 513        |
| 11:45 AM    | 0                              | 134  | 11    | 0    | 2                               | 0    | 0     | 0    | 83                             | 107  | 2     | 0    | 14                              | 0    | 128   | 3    | 484        |
| Total       | 0                              | 551  | 56    | 1    | 4                               | 0    | 1     | 0    | 320                            | 408  | 7     | 0    | 49                              | 27   | 558   | 3    | 1985       |
| 12:00 PM    | 0                              | 186  | 14    | 0    | 2                               | 0    | 0     | 0    | 90                             | 155  | 1     | 0    | 17                              | 2    | 132   | 0    | 599        |
| 12:15 PM    | 0                              | 148  | 8     | 0    | 3                               | 0    | 0     | 0    | 93                             | 150  | 0     | 0    | 7                               | 7    | 136   | 0    | 552        |
| 12:30 PM    | 1                              | 128  | 15    | 0    | 0                               | 1    | 1     | 0    | 78                             | 148  | 2     | 0    | 7                               | 11   | 98    | 0    | 490        |
| 12:45 PM    | 0                              | 123  | 22    | 0    | 0                               | 2    | 0     | 0    | 84                             | 149  | 0     | 0    | 10                              | 2    | 88    | 0    | 480        |
| Total       | 1                              | 585  | 59    | 0    | 5                               | 3    | 1     | 0    | 345                            | 602  | 3     | 0    | 41                              | 22   | 454   | 0    | 2121       |
| Grand Total | 1                              | 1136 | 115   | 1    | 9                               | 3    | 2     | 0    | 665                            | 1010 | 10    | 0    | 90                              | 49   | 1012  | 3    | 4106       |
| Apprch %    | 0.1                            | 90.7 | 9.2   | 0.1  | 64.3                            | 21.4 | 14.3  | 0    | 39.5                           | 59.9 | 0.6   | 0    | 7.8                             | 4.2  | 87.7  | 0.3  |            |
| Total %     | 0                              | 27.7 | 2.8   | 0    | 0.2                             | 0.1  | 0     | 0    | 16.2                           | 24.6 | 0.2   | 0    | 2.2                             | 1.2  | 24.6  | 0.1  |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

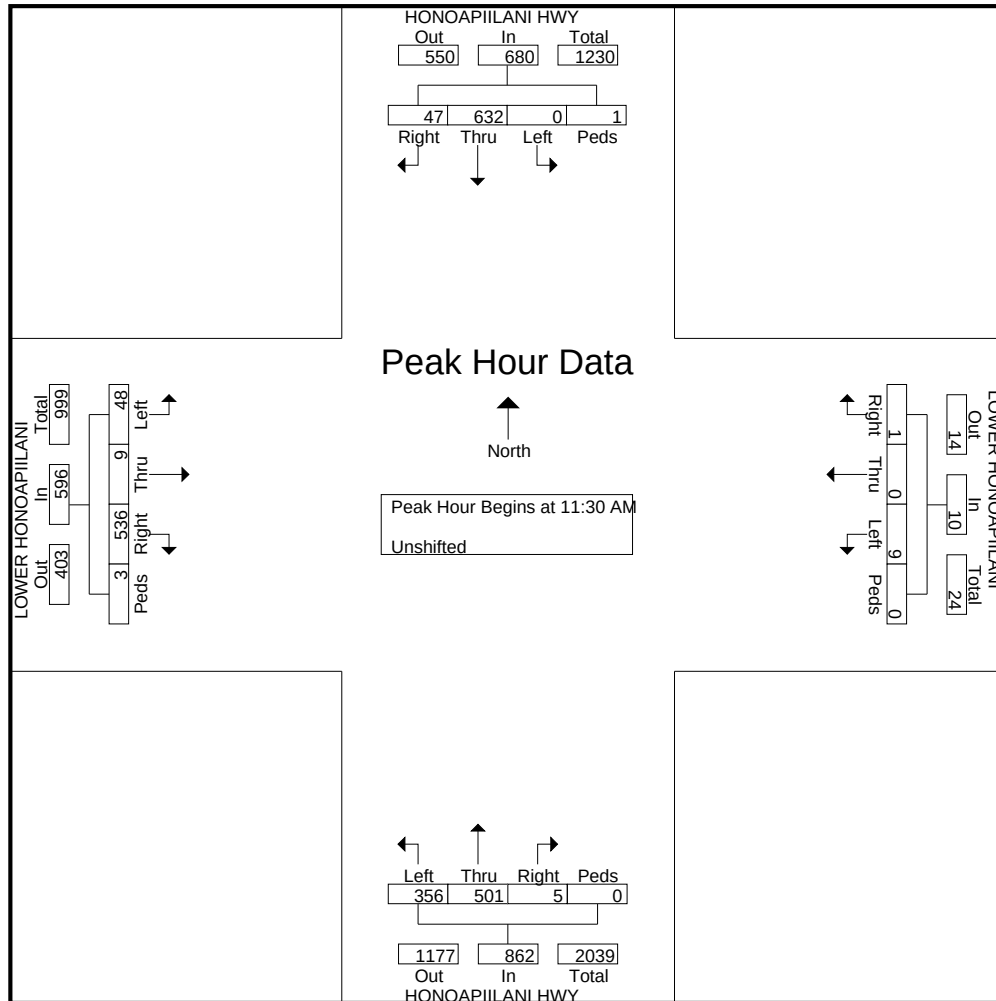
File Name : WE\_Honoapiilani Hwy - Lower Honoapiilani Rd

Site Code : 00000000

Start Date : 12/10/2016

Page No : 2

|                                                                   | HONOAPIILANI HWY<br>Southbound |      |       |      |            | LOWER HONOAPIILANI<br>Westbound |      |       |      |            | HONOAPIILANI HWY<br>Northbound |      |       |      |            | LOWER HONOAPIILANI<br>Eastbound |      |       |      |            |            |
|-------------------------------------------------------------------|--------------------------------|------|-------|------|------------|---------------------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|---------------------------------|------|-------|------|------------|------------|
| Start Time                                                        | Left                           | Thru | Right | Peds | App. Total | Left                            | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Left                            | Thru | Right | Peds | App. Total | Int. Total |
| <b>Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1</b> |                                |      |       |      |            |                                 |      |       |      |            |                                |      |       |      |            |                                 |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 11:30 AM              |                                |      |       |      |            |                                 |      |       |      |            |                                |      |       |      |            |                                 |      |       |      |            |            |
| 11:30 AM                                                          | 0                              | 164  | 14    | 1    | 179        | 2                               | 0    | 1     | 0    | 3          | 90                             | 89   | 2     | 0    | 181        | 10                              | 0    | 140   | 0    | 150        | 513        |
| 11:45 AM                                                          | 0                              | 134  | 11    | 0    | 145        | 2                               | 0    | 0     | 0    | 2          | 83                             | 107  | 2     | 0    | 192        | 14                              | 0    | 128   | 3    | 145        | 484        |
| 12:00 PM                                                          | 0                              | 186  | 14    | 0    | 200        | 2                               | 0    | 0     | 0    | 2          | 90                             | 155  | 1     | 0    | 246        | 17                              | 2    | 132   | 0    | 151        | 599        |
| 12:15 PM                                                          | 0                              | 148  | 8     | 0    | 156        | 3                               | 0    | 0     | 0    | 3          | 93                             | 150  | 0     | 0    | 243        | 7                               | 7    | 136   | 0    | 150        | 552        |
| Total Volume                                                      | 0                              | 632  | 47    | 1    | 680        | 9                               | 0    | 1     | 0    | 10         | 356                            | 501  | 5     | 0    | 862        | 48                              | 9    | 536   | 3    | 596        | 2148       |
| % App. Total                                                      | 0                              | 92.9 | 6.9   | 0.1  |            | 90                              | 0    | 10    | 0    |            | 41.3                           | 58.1 | 0.6   | 0    |            | 8.1                             | 1.5  | 89.9  | 0.5  |            |            |
| PHF                                                               | .000                           | .849 | .839  | .250 | .850       | .750                            | .000 | .250  | .000 | .833       | .957                           | .808 | .625  | .000 | .876       | .706                            | .321 | .957  | .250 | .987       | .896       |





# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : WE\_Honoapiilani Hwy - Halawai Dr

Site Code : 00000000

Start Date : 12/10/2016

Page No : 1

## Groups Printed- Unshifted

|             | HONOAPIILANI HWY<br>Southbound |      |       |      | HALAWAI DR<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |      | HALAWAI DR<br>Eastbound |      |       |      |            |
|-------------|--------------------------------|------|-------|------|-------------------------|------|-------|------|--------------------------------|------|-------|------|-------------------------|------|-------|------|------------|
| Start Time  | Left                           | Thru | Right | Peds | Left                    | Thru | Right | Peds | Left                           | Thru | Right | Peds | Left                    | Thru | Right | Peds | Int. Total |
| 11:00 AM    | 0                              | 290  | 6     | 0    | 0                       | 3    | 2     | 0    | 6                              | 149  | 0     | 0    | 1                       | 0    | 8     | 0    | 465        |
| 11:15 AM    | 0                              | 288  | 4     | 0    | 1                       | 0    | 0     | 0    | 3                              | 188  | 1     | 0    | 2                       | 0    | 10    | 0    | 497        |
| 11:30 AM    | 1                              | 318  | 11    | 0    | 5                       | 1    | 1     | 0    | 6                              | 203  | 2     | 0    | 3                       | 0    | 11    | 0    | 562        |
| 11:45 AM    | 4                              | 266  | 8     | 2    | 3                       | 1    | 5     | 0    | 17                             | 191  | 6     | 0    | 7                       | 2    | 13    | 0    | 525        |
| Total       | 5                              | 1162 | 29    | 2    | 9                       | 5    | 8     | 0    | 32                             | 731  | 9     | 0    | 13                      | 2    | 42    | 0    | 2049       |
| 12:00 PM    | 2                              | 259  | 8     | 4    | 4                       | 0    | 2     | 0    | 11                             | 219  | 5     | 0    | 7                       | 0    | 21    | 3    | 545        |
| 12:15 PM    | 2                              | 298  | 12    | 1    | 2                       | 0    | 4     | 0    | 9                              | 213  | 2     | 0    | 9                       | 0    | 21    | 0    | 573        |
| 12:30 PM    | 2                              | 236  | 4     | 0    | 6                       | 0    | 4     | 0    | 10                             | 226  | 6     | 0    | 4                       | 2    | 12    | 2    | 514        |
| Grand Total | 11                             | 1955 | 53    | 7    | 21                      | 5    | 18    | 0    | 62                             | 1389 | 22    | 0    | 33                      | 4    | 96    | 5    | 3681       |
| Apprch %    | 0.5                            | 96.5 | 2.6   | 0.3  | 47.7                    | 11.4 | 40.9  | 0    | 4.2                            | 94.3 | 1.5   | 0    | 23.9                    | 2.9  | 69.6  | 3.6  |            |
| Total %     | 0.3                            | 53.1 | 1.4   | 0.2  | 0.6                     | 0.1  | 0.5   | 0    | 1.7                            | 37.7 | 0.6   | 0    | 0.9                     | 0.1  | 2.6   | 0.1  |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

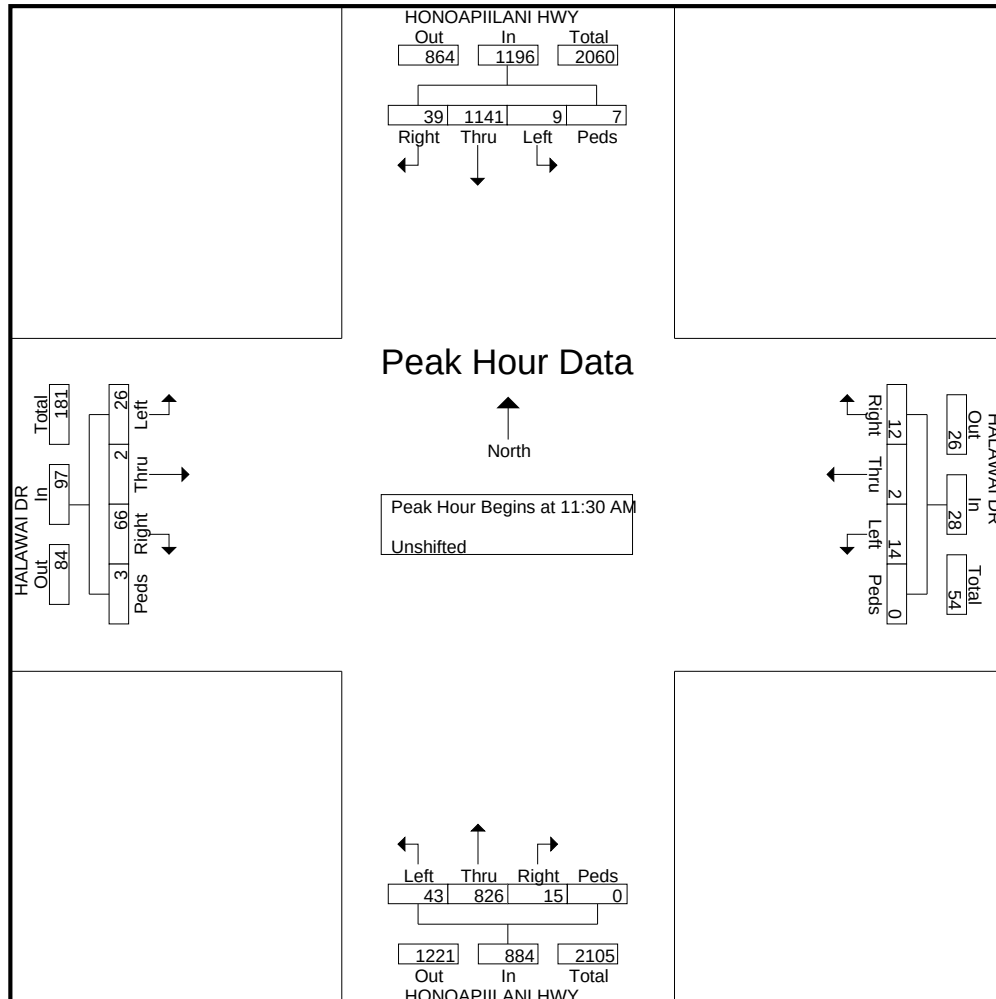
File Name : WE\_Honoapiilani Hwy - Halawai Dr

Site Code : 00000000

Start Date : 12/10/2016

Page No : 2

|                                                                   | HONOAPIILANI HWY<br>Southbound |            |           |          |            | HALAWAI DR<br>Westbound |          |          |      |            | HONOAPIILANI HWY<br>Northbound |            |          |      |            | HALAWAI DR<br>Eastbound |          |           |          |            |            |
|-------------------------------------------------------------------|--------------------------------|------------|-----------|----------|------------|-------------------------|----------|----------|------|------------|--------------------------------|------------|----------|------|------------|-------------------------|----------|-----------|----------|------------|------------|
| Start Time                                                        | Left                           | Thru       | Right     | Peds     | App. Total | Left                    | Thru     | Right    | Peds | App. Total | Left                           | Thru       | Right    | Peds | App. Total | Left                    | Thru     | Right     | Peds     | App. Total | Int. Total |
| <b>Peak Hour Analysis From 11:00 AM to 12:30 PM - Peak 1 of 1</b> |                                |            |           |          |            |                         |          |          |      |            |                                |            |          |      |            |                         |          |           |          |            |            |
| Peak Hour for Entire Intersection Begins at 11:30 AM              |                                |            |           |          |            |                         |          |          |      |            |                                |            |          |      |            |                         |          |           |          |            |            |
| 11:30 AM                                                          | 1                              | <b>318</b> | 11        | 0        | <b>330</b> | <b>5</b>                | <b>1</b> | 1        | 0    | 7          | 6                              | 203        | 2        | 0    | 211        | 3                       | 0        | 11        | 0        | 14         | 562        |
| 11:45 AM                                                          | <b>4</b>                       | 266        | 8         | 2        | 280        | 3                       | 1        | <b>5</b> | 0    | <b>9</b>   | <b>17</b>                      | 191        | <b>6</b> | 0    | 214        | 7                       | <b>2</b> | 13        | 0        | 22         | 525        |
| 12:00 PM                                                          | 2                              | 259        | 8         | <b>4</b> | 273        | 4                       | 0        | 2        | 0    | 6          | 11                             | <b>219</b> | 5        | 0    | <b>235</b> | 7                       | 0        | <b>21</b> | <b>3</b> | <b>31</b>  | 545        |
| 12:15 PM                                                          | 2                              | 298        | <b>12</b> | 1        | 313        | 2                       | 0        | 4        | 0    | 6          | 9                              | 213        | 2        | 0    | 224        | <b>9</b>                | 0        | 21        | 0        | 30         | <b>573</b> |
| Total Volume                                                      | 9                              | 1141       | 39        | 7        | 1196       | 14                      | 2        | 12       | 0    | 28         | 43                             | 826        | 15       | 0    | 884        | 26                      | 2        | 66        | 3        | 97         | 2205       |
| % App. Total                                                      | 0.8                            | 95.4       | 3.3       | 0.6      |            | 50                      | 7.1      | 42.9     | 0    |            | 4.9                            | 93.4       | 1.7      | 0    |            | 26.8                    | 2.1      | 68        | 3.1      |            |            |
| PHF                                                               | .563                           | .897       | .813      | .438     | .906       | .700                    | .500     | .600     | .000 | .778       | .632                           | .943       | .625     | .000 | .940       | .722                    | .250     | .786      | .250     | .782       | .962       |



# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : WE\_Honoapiilani Hwy-Puukolii Rd

Site Code : 00000000

Start Date : 12/10/2016

Page No : 1

Groups Printed- Unshifted

|             | KAI ALA DR<br>Eastbound |      |       |      | PUUKOLII RD<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |        |      | HONOAPIILANI HWY<br>Southbound |      |       |        |      |            |
|-------------|-------------------------|------|-------|------|--------------------------|------|-------|------|--------------------------------|------|-------|--------|------|--------------------------------|------|-------|--------|------|------------|
| Start Time  | Left                    | Thru | Right | Peds | Left                     | Thru | Right | Peds | Left                           | Thru | Right | U-Turn | Peds | Left                           | Thru | Right | U-Turn | Peds | Int. Total |
| 11:00 AM    | 14                      | 0    | 46    | 0    | 8                        | 0    | 4     | 0    | 15                             | 140  | 6     | 0      | 0    | 2                              | 283  | 11    | 0      | 0    | 529        |
| 11:15 AM    | 10                      | 1    | 47    | 0    | 10                       | 0    | 11    | 0    | 21                             | 165  | 11    | 2      | 0    | 6                              | 257  | 14    | 1      | 0    | 556        |
| 11:30 AM    | 13                      | 1    | 42    | 0    | 11                       | 0    | 6     | 0    | 18                             | 187  | 13    | 0      | 0    | 9                              | 284  | 15    | 0      | 0    | 599        |
| 11:45 AM    | 13                      | 1    | 38    | 0    | 14                       | 1    | 10    | 0    | 28                             | 173  | 9     | 0      | 0    | 5                              | 272  | 18    | 0      | 0    | 582        |
| Total       | 50                      | 3    | 173   | 0    | 43                       | 1    | 31    | 0    | 82                             | 665  | 39    | 2      | 0    | 22                             | 1096 | 58    | 1      | 0    | 2266       |
| 12:00 PM    | 7                       | 0    | 42    | 0    | 10                       | 1    | 4     | 0    | 25                             | 216  | 9     | 0      | 0    | 7                              | 262  | 14    | 0      | 0    | 597        |
| 12:15 PM    | 15                      | 0    | 45    | 0    | 3                        | 1    | 7     | 0    | 30                             | 206  | 14    | 2      | 0    | 6                              | 296  | 16    | 0      | 0    | 641        |
| 12:30 PM    | 9                       | 0    | 41    | 0    | 9                        | 0    | 6     | 0    | 36                             | 230  | 12    | 0      | 0    | 6                              | 251  | 11    | 0      | 0    | 611        |
| 12:45 PM    | 20                      | 0    | 26    | 0    | 9                        | 0    | 9     | 0    | 39                             | 231  | 7     | 0      | 0    | 8                              | 217  | 15    | 0      | 0    | 581        |
| Total       | 51                      | 0    | 154   | 0    | 31                       | 2    | 26    | 0    | 130                            | 883  | 42    | 2      | 0    | 27                             | 1026 | 56    | 0      | 0    | 2430       |
| Grand Total | 101                     | 3    | 327   | 0    | 74                       | 3    | 57    | 0    | 212                            | 1548 | 81    | 4      | 0    | 49                             | 2122 | 114   | 1      | 0    | 4696       |
| Apprch %    | 23.4                    | 0.7  | 75.9  | 0    | 55.2                     | 2.2  | 42.5  | 0    | 11.5                           | 83.9 | 4.4   | 0.2    | 0    | 2.1                            | 92.8 | 5     | 0      | 0    |            |
| Total %     | 2.2                     | 0.1  | 7     | 0    | 1.6                      | 0.1  | 1.2   | 0    | 4.5                            | 33   | 1.7   | 0.1    | 0    | 1                              | 45.2 | 2.4   | 0      | 0    |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

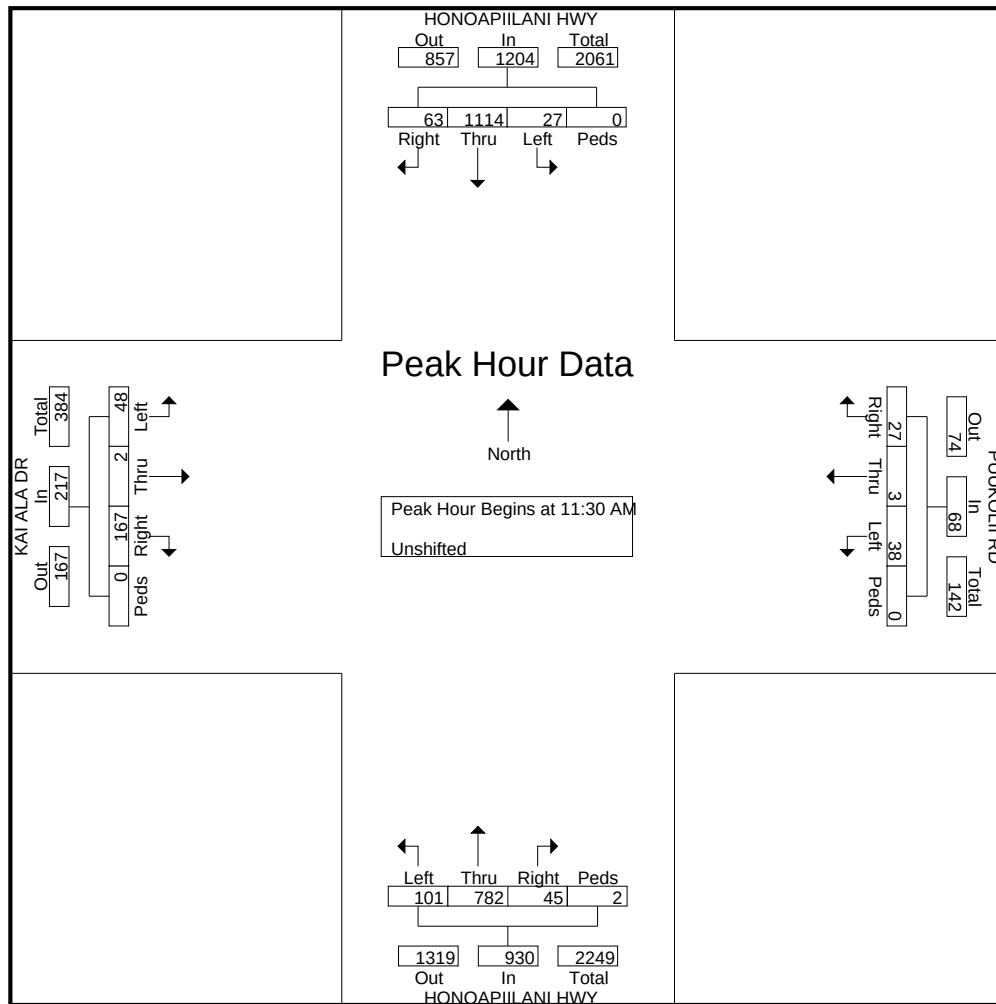
File Name : WE\_Honoapiilani Hwy-Puukolii Rd

Site Code : 00000000

Start Date : 12/10/2016

Page No : 2

|                                                            | KAI ALA DR<br>Eastbound |      |       |      |            | PUUKOLII RD<br>Westbound |      |       |      |            | HONOAPIILANI HWY<br>Northbound |      |       |        |      |            | HONOAPIILANI HWY<br>Southbound |      |       |        |      |            |            |  |
|------------------------------------------------------------|-------------------------|------|-------|------|------------|--------------------------|------|-------|------|------------|--------------------------------|------|-------|--------|------|------------|--------------------------------|------|-------|--------|------|------------|------------|--|
| Start Time                                                 | Left                    | Thru | Right | Peds | App. Total | Left                     | Thru | Right | Peds | App. Total | Left                           | Thru | Right | U-Turn | Peds | App. Total | Left                           | Thru | Right | U-Turn | Peds | App. Total | Int. Total |  |
| Peak Hour Analysis From 11:30 AM to 12:15 PM - Peak 1 of 1 |                         |      |       |      |            |                          |      |       |      |            |                                |      |       |        |      |            |                                |      |       |        |      |            |            |  |
| Peak Hour for Entire Intersection Begins at 11:30 AM       |                         |      |       |      |            |                          |      |       |      |            |                                |      |       |        |      |            |                                |      |       |        |      |            |            |  |
| 11:30 AM                                                   | 13                      | 1    | 42    | 0    | 56         | 11                       | 0    | 6     | 0    | 17         | 18                             | 187  | 13    | 0      | 0    | 218        | 9                              | 284  | 15    | 0      | 0    | 308        | 599        |  |
| 11:45 AM                                                   | 13                      | 1    | 38    | 0    | 52         | 14                       | 1    | 10    | 0    | 25         | 28                             | 173  | 9     | 0      | 0    | 210        | 5                              | 272  | 18    | 0      | 0    | 295        | 582        |  |
| 12:00 PM                                                   | 7                       | 0    | 42    | 0    | 49         | 10                       | 1    | 4     | 0    | 15         | 25                             | 216  | 9     | 0      | 0    | 250        | 7                              | 262  | 14    | 0      | 0    | 283        | 597        |  |
| 12:15 PM                                                   | 15                      | 0    | 45    | 0    | 60         | 3                        | 1    | 7     | 0    | 11         | 30                             | 206  | 14    | 2      | 0    | 252        | 6                              | 296  | 16    | 0      | 0    | 318        | 641        |  |
| Total Volume                                               | 48                      | 2    | 167   | 0    | 217        | 38                       | 3    | 27    | 0    | 68         | 101                            | 782  | 45    | 2      | 0    | 930        | 27                             | 1114 | 63    | 0      | 0    | 1204       | 2419       |  |
| % App. Total                                               | 22.1                    | 0.9  | 77    | 0    |            | 55.9                     | 4.4  | 39.7  | 0    |            | 10.9                           | 84.1 | 4.8   | 0.2    | 0    |            | 2.2                            | 92.5 | 5.2   | 0      | 0    |            |            |  |
| PHF                                                        | .800                    | .500 | .928  | .000 | .904       | .679                     | .750 | .675  | .000 | .680       | .842                           | .905 | .804  | .250   | .000 | .923       | .750                           | .941 | .875  | .000   | .000 | .947       | .943       |  |



# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : WE\_Honopiilani Hwy - Kaanapali Pkwy\_Halelo St

Site Code : 00000000

Start Date : 1/21/2017

Page No : 1

Groups Printed- Unshifted

|             | HONOAPIILANI HWY<br>Southbound |      |       |      | HALELO ST<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |      | KAANAPALI PKWY<br>Eastbound |      |       |      |            |
|-------------|--------------------------------|------|-------|------|------------------------|------|-------|------|--------------------------------|------|-------|------|-----------------------------|------|-------|------|------------|
| Start Time  | Left                           | Thru | Right | Peds | Left                   | Thru | Right | Peds | Left                           | Thru | Right | Peds | Left                        | Thru | Right | Peds | Int. Total |
| 11:00 AM    | 10                             | 382  | 55    | 0    | 0                      | 0    | 1     | 0    | 70                             | 191  | 7     | 0    | 58                          | 0    | 101   | 0    | 875        |
| 11:15 AM    | 11                             | 314  | 31    | 0    | 4                      | 0    | 0     | 0    | 83                             | 188  | 6     | 0    | 54                          | 0    | 107   | 0    | 798        |
| 11:30 AM    | 5                              | 342  | 40    | 0    | 3                      | 1    | 1     | 0    | 57                             | 247  | 3     | 0    | 48                          | 0    | 108   | 1    | 856        |
| 11:45 AM    | 6                              | 272  | 28    | 0    | 5                      | 1    | 6     | 0    | 61                             | 202  | 2     | 0    | 60                          | 1    | 94    | 0    | 738        |
| Total       | 32                             | 1310 | 154   | 0    | 12                     | 2    | 8     | 0    | 271                            | 828  | 18    | 0    | 220                         | 1    | 410   | 1    | 3267       |
| 12:00 PM    | 9                              | 294  | 35    | 0    | 3                      | 1    | 4     | 0    | 74                             | 220  | 5     | 0    | 37                          | 0    | 108   | 0    | 790        |
| 12:15 PM    | 5                              | 233  | 33    | 0    | 1                      | 0    | 4     | 0    | 88                             | 239  | 2     | 0    | 59                          | 0    | 122   | 0    | 786        |
| 12:30 PM    | 14                             | 267  | 31    | 0    | 2                      | 1    | 1     | 0    | 81                             | 243  | 2     | 0    | 52                          | 1    | 114   | 0    | 809        |
| 12:45 PM    | 6                              | 211  | 28    | 0    | 3                      | 3    | 2     | 0    | 84                             | 289  | 5     | 0    | 46                          | 0    | 86    | 0    | 763        |
| Total       | 34                             | 1005 | 127   | 0    | 9                      | 5    | 11    | 0    | 327                            | 991  | 14    | 0    | 194                         | 1    | 430   | 0    | 3148       |
| Grand Total | 66                             | 2315 | 281   | 0    | 21                     | 7    | 19    | 0    | 598                            | 1819 | 32    | 0    | 414                         | 2    | 840   | 1    | 6415       |
| Apprch %    | 2.5                            | 87   | 10.6  | 0    | 44.7                   | 14.9 | 40.4  | 0    | 24.4                           | 74.3 | 1.3   | 0    | 32.9                        | 0.2  | 66.8  | 0.1  |            |
| Total %     | 1                              | 36.1 | 4.4   | 0    | 0.3                    | 0.1  | 0.3   | 0    | 9.3                            | 28.4 | 0.5   | 0    | 6.5                         | 0    | 13.1  | 0    |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

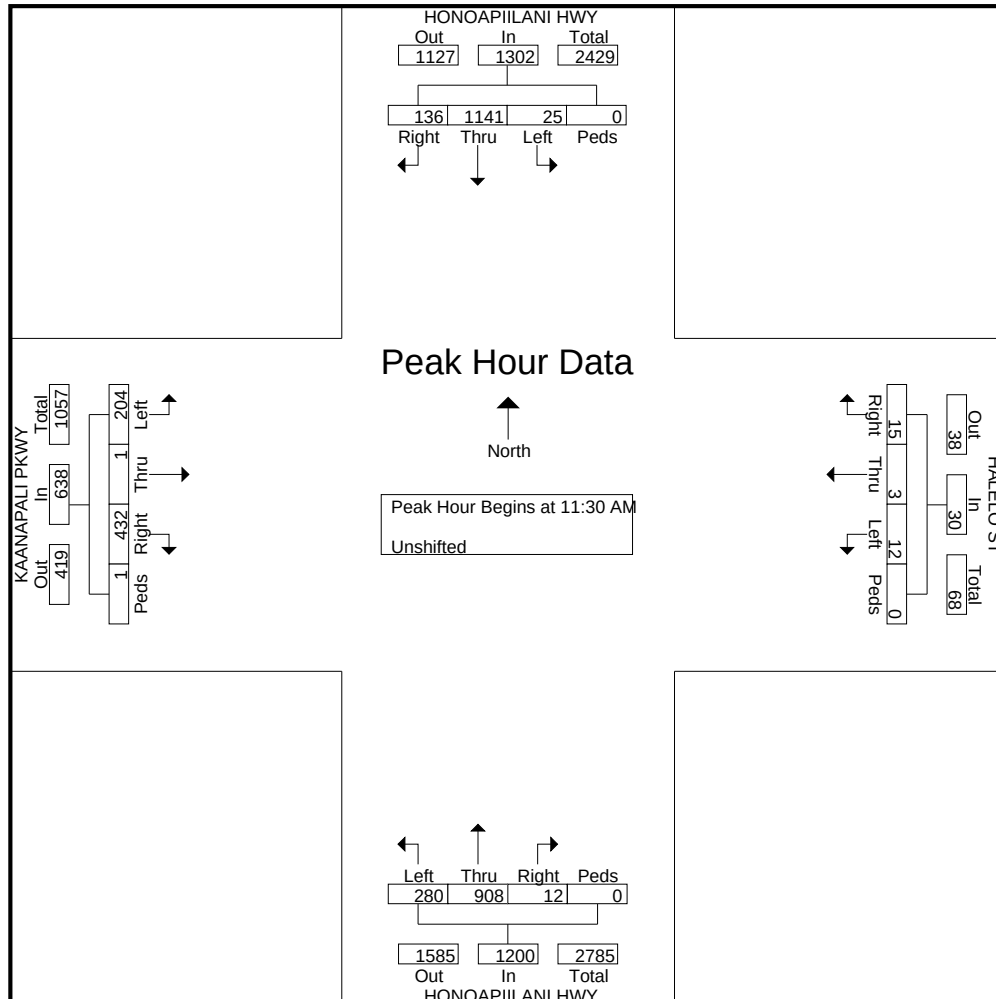
File Name : WE\_Honopiilani Hwy - Kaanapali Pkwy\_Halelo St

Site Code : 00000000

Start Date : 1/21/2017

Page No : 2

|                                                                   | HONOAPIILANI HWY<br>Southbound |            |           |      |            | HALELO ST<br>Westbound |          |          |      |            | HONOAPIILANI HWY<br>Northbound |            |          |      |            | KAANAPALI PKWY<br>Eastbound |          |            |          |            |            |
|-------------------------------------------------------------------|--------------------------------|------------|-----------|------|------------|------------------------|----------|----------|------|------------|--------------------------------|------------|----------|------|------------|-----------------------------|----------|------------|----------|------------|------------|
| Start Time                                                        | Left                           | Thru       | Right     | Peds | App. Total | Left                   | Thru     | Right    | Peds | App. Total | Left                           | Thru       | Right    | Peds | App. Total | Left                        | Thru     | Right      | Peds     | App. Total | Int. Total |
| <b>Peak Hour Analysis From 11:30 AM to 12:15 PM - Peak 1 of 1</b> |                                |            |           |      |            |                        |          |          |      |            |                                |            |          |      |            |                             |          |            |          |            |            |
| Peak Hour for Entire Intersection Begins at 11:30 AM              |                                |            |           |      |            |                        |          |          |      |            |                                |            |          |      |            |                             |          |            |          |            |            |
| 11:30 AM                                                          | 5                              | <b>342</b> | <b>40</b> | 0    | <b>387</b> | 3                      | <b>1</b> | 1        | 0    | 5          | 57                             | <b>247</b> | 3        | 0    | 307        | 48                          | 0        | 108        | <b>1</b> | 157        | <b>856</b> |
| 11:45 AM                                                          | 6                              | 272        | 28        | 0    | 306        | <b>5</b>               | 1        | <b>6</b> | 0    | <b>12</b>  | 61                             | 202        | 2        | 0    | 265        | <b>60</b>                   | <b>1</b> | 94         | 0        | 155        | 738        |
| 12:00 PM                                                          | <b>9</b>                       | 294        | 35        | 0    | 338        | 3                      | 1        | 4        | 0    | 8          | 74                             | 220        | <b>5</b> | 0    | 299        | 37                          | 0        | 108        | 0        | 145        | 790        |
| 12:15 PM                                                          | 5                              | 233        | 33        | 0    | 271        | 1                      | 0        | 4        | 0    | 5          | <b>88</b>                      | 239        | 2        | 0    | <b>329</b> | 59                          | 0        | <b>122</b> | 0        | <b>181</b> | 786        |
| Total Volume                                                      | 25                             | 1141       | 136       | 0    | 1302       | 12                     | 3        | 15       | 0    | 30         | 280                            | 908        | 12       | 0    | 1200       | 204                         | 1        | 432        | 1        | 638        | 3170       |
| % App. Total                                                      | 1.9                            | 87.6       | 10.4      | 0    |            | 40                     | 10       | 50       | 0    |            | 23.3                           | 75.7       | 1        | 0    |            | 32                          | 0.2      | 67.7       | 0.2      |            |            |
| PHF                                                               | .694                           | .834       | .850      | .000 | .841       | .600                   | .750     | .625     | .000 | .625       | .795                           | .919       | .600     | .000 | .912       | .850                        | .250     | .885       | .250     | .881       | .926       |



# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : WE\_Honoapiilani Hwy-Leialii Pkwy

Site Code : 00000000

Start Date : 12/10/2016

Page No : 1

Groups Printed- Unshifted

|             | LEIALII PKWY<br>Eastbound |      |       |      | LEIALII PKWY<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |      | HONOAPIILANI HWY<br>Southbound |      |       |      |            |
|-------------|---------------------------|------|-------|------|---------------------------|------|-------|------|--------------------------------|------|-------|------|--------------------------------|------|-------|------|------------|
| Start Time  | Left                      | Thru | Right | Peds | Left                      | Thru | Right | Peds | Left                           | Thru | Right | Peds | Left                           | Thru | Right | Peds | Int. Total |
| 11:00 AM    | 0                         | 1    | 1     | 0    | 23                        | 1    | 4     | 0    | 1                              | 187  | 12    | 0    | 19                             | 378  | 4     | 0    | 631        |
| 11:15 AM    | 1                         | 0    | 2     | 0    | 18                        | 0    | 12    | 0    | 0                              | 216  | 13    | 0    | 18                             | 410  | 0     | 0    | 690        |
| 11:30 AM    | 0                         | 0    | 2     | 0    | 47                        | 1    | 16    | 0    | 0                              | 228  | 25    | 0    | 21                             | 371  | 0     | 0    | 711        |
| 11:45 AM    | 0                         | 0    | 0     | 0    | 33                        | 0    | 16    | 0    | 0                              | 286  | 26    | 0    | 25                             | 392  | 1     | 0    | 779        |
| Total       | 1                         | 1    | 5     | 0    | 121                       | 2    | 48    | 0    | 1                              | 917  | 76    | 0    | 83                             | 1551 | 5     | 0    | 2811       |
| 12:00 PM    | 2                         | 0    | 0     | 0    | 30                        | 0    | 9     | 0    | 1                              | 291  | 10    | 0    | 14                             | 398  | 3     | 0    | 758        |
| 12:15 PM    | 0                         | 0    | 1     | 0    | 20                        | 0    | 10    | 0    | 1                              | 278  | 22    | 0    | 18                             | 397  | 2     | 0    | 749        |
| 12:30 PM    | 0                         | 0    | 1     | 0    | 19                        | 0    | 15    | 0    | 0                              | 333  | 17    | 0    | 12                             | 376  | 0     | 0    | 773        |
| 12:45 PM    | 2                         | 0    | 0     | 0    | 21                        | 0    | 18    | 0    | 0                              | 324  | 24    | 0    | 14                             | 296  | 0     | 1    | 700        |
| Total       | 4                         | 0    | 2     | 0    | 90                        | 0    | 52    | 0    | 2                              | 1226 | 73    | 0    | 58                             | 1467 | 5     | 1    | 2980       |
| Grand Total | 5                         | 1    | 7     | 0    | 211                       | 2    | 100   | 0    | 3                              | 2143 | 149   | 0    | 141                            | 3018 | 10    | 1    | 5791       |
| Apprch %    | 38.5                      | 7.7  | 53.8  | 0    | 67.4                      | 0.6  | 31.9  | 0    | 0.1                            | 93.4 | 6.5   | 0    | 4.4                            | 95.2 | 0.3   | 0    |            |
| Total %     | 0.1                       | 0    | 0.1   | 0    | 3.6                       | 0    | 1.7   | 0    | 0.1                            | 37   | 2.6   | 0    | 2.4                            | 52.1 | 0.2   | 0    |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

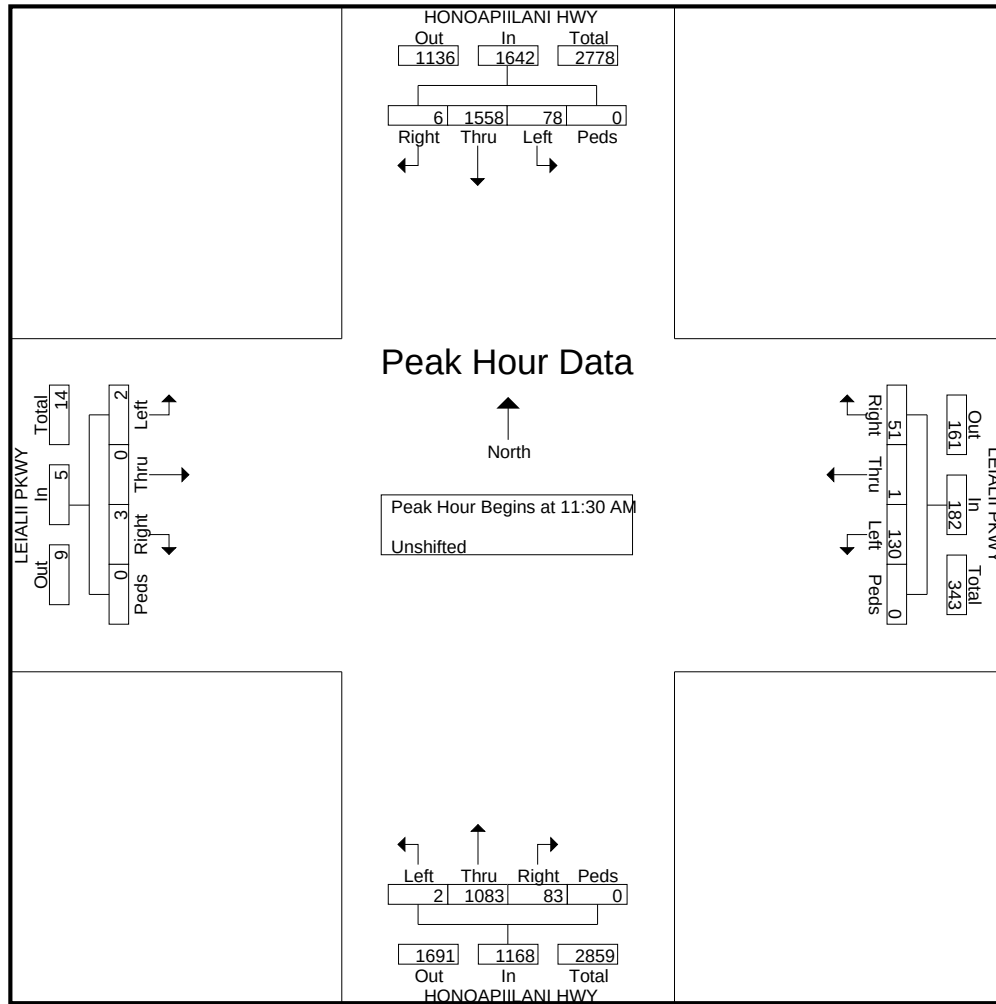
File Name : WE\_Honoapiilani Hwy-Leialii Pkwy

Site Code : 00000000

Start Date : 12/10/2016

Page No : 2

|                                                            | LEIALII PKWY<br>Eastbound |      |       |      |            | LEIALII PKWY<br>Westbound |      |       |      |            | HONOAPIILANI HWY<br>Northbound |      |       |      |            | HONOAPIILANI HWY<br>Southbound |      |       |      |            |            |
|------------------------------------------------------------|---------------------------|------|-------|------|------------|---------------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|------------|
| Start Time                                                 | Left                      | Thru | Right | Peds | App. Total | Left                      | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Int. Total |
| Peak Hour Analysis From 11:30 AM to 12:15 PM - Peak 1 of 1 |                           |      |       |      |            |                           |      |       |      |            |                                |      |       |      |            |                                |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 11:30 AM       |                           |      |       |      |            |                           |      |       |      |            |                                |      |       |      |            |                                |      |       |      |            |            |
| 11:30 AM                                                   | 0                         | 0    | 2     | 0    | 2          | 47                        | 1    | 16    | 0    | 64         | 0                              | 228  | 25    | 0    | 253        | 21                             | 371  | 0     | 0    | 392        | 711        |
| 11:45 AM                                                   | 0                         | 0    | 0     | 0    | 0          | 33                        | 0    | 16    | 0    | 49         | 0                              | 286  | 26    | 0    | 312        | 25                             | 392  | 1     | 0    | 418        | 779        |
| 12:00 PM                                                   | 2                         | 0    | 0     | 0    | 2          | 30                        | 0    | 9     | 0    | 39         | 1                              | 291  | 10    | 0    | 302        | 14                             | 398  | 3     | 0    | 415        | 758        |
| 12:15 PM                                                   | 0                         | 0    | 1     | 0    | 1          | 20                        | 0    | 10    | 0    | 30         | 1                              | 278  | 22    | 0    | 301        | 18                             | 397  | 2     | 0    | 417        | 749        |
| Total Volume                                               | 2                         | 0    | 3     | 0    | 5          | 130                       | 1    | 51    | 0    | 182        | 2                              | 1083 | 83    | 0    | 1168       | 78                             | 1558 | 6     | 0    | 1642       | 2997       |
| % App. Total                                               | 40                        | 0    | 60    | 0    |            | 71.4                      | 0.5  | 28    | 0    |            | 0.2                            | 92.7 | 7.1   | 0    |            | 4.8                            | 94.9 | 0.4   | 0    |            |            |
| PHF                                                        | .250                      | .000 | .375  | .000 | .625       | .691                      | .250 | .797  | .000 | .711       | .500                           | .930 | .798  | .000 | .936       | .780                           | .979 | .500  | .000 | .982       | .962       |





# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : WE\_Honoapiilani Hwy - Front St

Site Code : 00000000

Start Date : 12/10/2016

Page No : 1

## Groups Printed- Unshifted

|             | HONOAPIILANI HWY<br>Southbound |      |       |      | FRONT ST<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |      | FRONT ST<br>Eastbound |      |       |      |            |
|-------------|--------------------------------|------|-------|------|-----------------------|------|-------|------|--------------------------------|------|-------|------|-----------------------|------|-------|------|------------|
| Start Time  | Left                           | Thru | Right | Peds | Left                  | Thru | Right | Peds | Left                           | Thru | Right | Peds | Left                  | Thru | Right | Peds | Int. Total |
| 11:00 AM    | 3                              | 332  | 17    | 0    | 14                    | 2    | 2     | 0    | 4                              | 199  | 6     | 0    | 19                    | 0    | 4     | 0    | 602        |
| 11:15 AM    | 1                              | 349  | 42    | 0    | 15                    | 0    | 1     | 0    | 2                              | 242  | 3     | 0    | 22                    | 0    | 3     | 0    | 680        |
| 11:30 AM    | 2                              | 346  | 45    | 0    | 10                    | 0    | 2     | 0    | 5                              | 230  | 5     | 0    | 29                    | 0    | 3     | 0    | 677        |
| 11:45 AM    | 1                              | 339  | 52    | 0    | 17                    | 0    | 4     | 0    | 3                              | 272  | 4     | 0    | 24                    | 2    | 3     | 0    | 721        |
| Total       | 7                              | 1366 | 156   | 0    | 56                    | 2    | 9     | 0    | 14                             | 943  | 18    | 0    | 94                    | 2    | 13    | 0    | 2680       |
| 12:00 PM    | 2                              | 337  | 67    | 0    | 19                    | 2    | 2     | 0    | 1                              | 268  | 4     | 0    | 27                    | 1    | 4     | 1    | 735        |
| 12:15 PM    | 2                              | 347  | 71    | 0    | 16                    | 1    | 3     | 0    | 2                              | 275  | 2     | 0    | 34                    | 0    | 4     | 0    | 757        |
| 12:30 PM    | 1                              | 338  | 58    | 0    | 17                    | 4    | 3     | 0    | 1                              | 325  | 6     | 0    | 31                    | 4    | 4     | 0    | 792        |
| 12:45 PM    | 3                              | 246  | 44    | 0    | 13                    | 1    | 2     | 0    | 4                              | 323  | 6     | 0    | 31                    | 0    | 1     | 0    | 674        |
| Total       | 8                              | 1268 | 240   | 0    | 65                    | 8    | 10    | 0    | 8                              | 1191 | 18    | 0    | 123                   | 5    | 13    | 1    | 2958       |
| Grand Total | 15                             | 2634 | 396   | 0    | 121                   | 10   | 19    | 0    | 22                             | 2134 | 36    | 0    | 217                   | 7    | 26    | 1    | 5638       |
| Apprch %    | 0.5                            | 86.5 | 13    | 0    | 80.7                  | 6.7  | 12.7  | 0    | 1                              | 97.4 | 1.6   | 0    | 86.5                  | 2.8  | 10.4  | 0.4  |            |
| Total %     | 0.3                            | 46.7 | 7     | 0    | 2.1                   | 0.2  | 0.3   | 0    | 0.4                            | 37.9 | 0.6   | 0    | 3.8                   | 0.1  | 0.5   | 0    |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

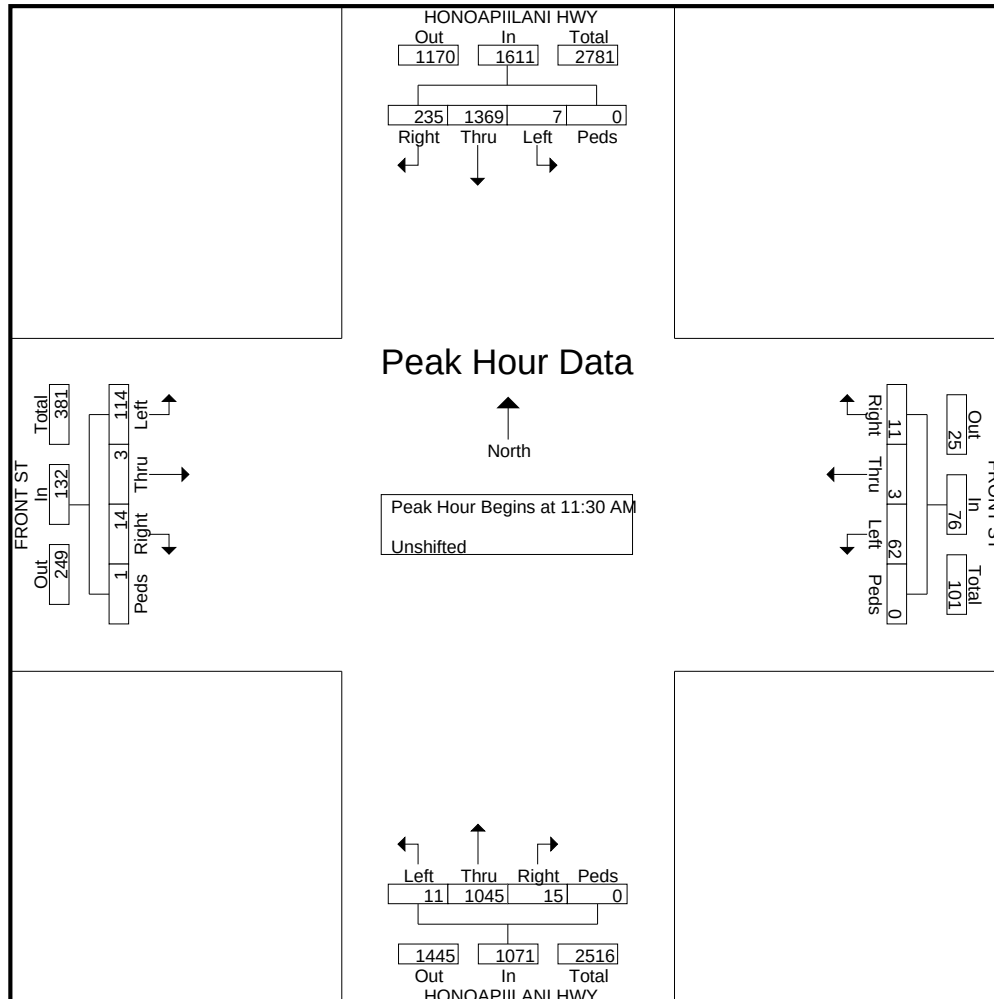
File Name : WE\_Honoapiilani Hwy - Front St

Site Code : 00000000

Start Date : 12/10/2016

Page No : 2

|                                                                   | HONOAPIILANI HWY<br>Southbound |      |       |      |            | FRONT ST<br>Westbound |      |       |      |            | HONOAPIILANI HWY<br>Northbound |      |       |      |            | FRONT ST<br>Eastbound |      |       |      |            |            |
|-------------------------------------------------------------------|--------------------------------|------|-------|------|------------|-----------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|-----------------------|------|-------|------|------------|------------|
| Start Time                                                        | Left                           | Thru | Right | Peds | App. Total | Left                  | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Left                  | Thru | Right | Peds | App. Total | Int. Total |
| <b>Peak Hour Analysis From 11:30 AM to 12:15 PM - Peak 1 of 1</b> |                                |      |       |      |            |                       |      |       |      |            |                                |      |       |      |            |                       |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 11:30 AM              |                                |      |       |      |            |                       |      |       |      |            |                                |      |       |      |            |                       |      |       |      |            |            |
| 11:30 AM                                                          | 2                              | 346  | 45    | 0    | 393        | 10                    | 0    | 2     | 0    | 12         | 5                              | 230  | 5     | 0    | 240        | 29                    | 0    | 3     | 0    | 32         | 677        |
| 11:45 AM                                                          | 1                              | 339  | 52    | 0    | 392        | 17                    | 0    | 4     | 0    | 21         | 3                              | 272  | 4     | 0    | 279        | 24                    | 2    | 3     | 0    | 29         | 721        |
| 12:00 PM                                                          | 2                              | 337  | 67    | 0    | 406        | 19                    | 2    | 2     | 0    | 23         | 1                              | 268  | 4     | 0    | 273        | 27                    | 1    | 4     | 1    | 33         | 735        |
| 12:15 PM                                                          | 2                              | 347  | 71    | 0    | 420        | 16                    | 1    | 3     | 0    | 20         | 2                              | 275  | 2     | 0    | 279        | 34                    | 0    | 4     | 0    | 38         | 757        |
| Total Volume                                                      | 7                              | 1369 | 235   | 0    | 1611       | 62                    | 3    | 11    | 0    | 76         | 11                             | 1045 | 15    | 0    | 1071       | 114                   | 3    | 14    | 1    | 132        | 2890       |
| % App. Total                                                      | 0.4                            | 85   | 14.6  | 0    |            | 81.6                  | 3.9  | 14.5  | 0    |            | 1                              | 97.6 | 1.4   | 0    |            | 86.4                  | 2.3  | 10.6  | 0.8  |            |            |
| PHF                                                               | .875                           | .986 | .827  | .000 | .959       | .816                  | .375 | .688  | .000 | .826       | .550                           | .950 | .750  | .000 | .960       | .838                  | .375 | .875  | .250 | .868       | .954       |



# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : WE\_Honoapiilani Hwy - Kapunakea St

Site Code : 00000000

Start Date : 1/21/2017

Page No : 1

## Groups Printed- Unshifted

|             | HONOAPIILANI HWY<br>Southbound |      |       |      | KAPUNAKEA ST<br>Westbound |      |       |      | KAPUNAKEA ST<br>Northbound |      |       |      | KAPUNAKEA ST<br>Eastbound |      |       |      |            |
|-------------|--------------------------------|------|-------|------|---------------------------|------|-------|------|----------------------------|------|-------|------|---------------------------|------|-------|------|------------|
| Start Time  | Left                           | Thru | Right | Peds | Left                      | Thru | Right | Peds | Left                       | Thru | Right | Peds | Left                      | Thru | Right | Peds | Int. Total |
| 11:00 AM    | 3                              | 347  | 19    | 0    | 23                        | 6    | 1     | 1    | 11                         | 256  | 13    | 0    | 36                        | 7    | 12    | 0    | 735        |
| 11:15 AM    | 2                              | 425  | 36    | 0    | 32                        | 0    | 1     | 1    | 15                         | 272  | 12    | 0    | 33                        | 8    | 5     | 0    | 842        |
| 11:30 AM    | 4                              | 413  | 35    | 1    | 18                        | 5    | 4     | 0    | 14                         | 289  | 12    | 2    | 32                        | 3    | 14    | 0    | 846        |
| 11:45 AM    | 7                              | 338  | 28    | 0    | 21                        | 5    | 1     | 2    | 11                         | 255  | 7     | 1    | 37                        | 5    | 7     | 0    | 725        |
| Total       | 16                             | 1523 | 118   | 1    | 94                        | 16   | 7     | 4    | 51                         | 1072 | 44    | 3    | 138                       | 23   | 38    | 0    | 3148       |
| 12:00 PM    | 1                              | 304  | 24    | 1    | 22                        | 5    | 1     | 6    | 21                         | 265  | 15    | 0    | 31                        | 4    | 15    | 2    | 717        |
| 12:15 PM    | 2                              | 334  | 31    | 0    | 22                        | 4    | 9     | 0    | 12                         | 313  | 25    | 0    | 39                        | 5    | 12    | 0    | 808        |
| 12:30 PM    | 4                              | 283  | 19    | 0    | 21                        | 2    | 4     | 3    | 16                         | 308  | 26    | 0    | 46                        | 3    | 12    | 0    | 747        |
| 12:45 PM    | 1                              | 275  | 24    | 3    | 18                        | 7    | 2     | 4    | 16                         | 314  | 17    | 0    | 30                        | 3    | 13    | 0    | 727        |
| Total       | 8                              | 1196 | 98    | 4    | 83                        | 18   | 16    | 13   | 65                         | 1200 | 83    | 0    | 146                       | 15   | 52    | 2    | 2999       |
| Grand Total | 24                             | 2719 | 216   | 5    | 177                       | 34   | 23    | 17   | 116                        | 2272 | 127   | 3    | 284                       | 38   | 90    | 2    | 6147       |
| Apprch %    | 0.8                            | 91.7 | 7.3   | 0.2  | 70.5                      | 13.5 | 9.2   | 6.8  | 4.6                        | 90.2 | 5     | 0.1  | 68.6                      | 9.2  | 21.7  | 0.5  |            |
| Total %     | 0.4                            | 44.2 | 3.5   | 0.1  | 2.9                       | 0.6  | 0.4   | 0.3  | 1.9                        | 37   | 2.1   | 0    | 4.6                       | 0.6  | 1.5   | 0    |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

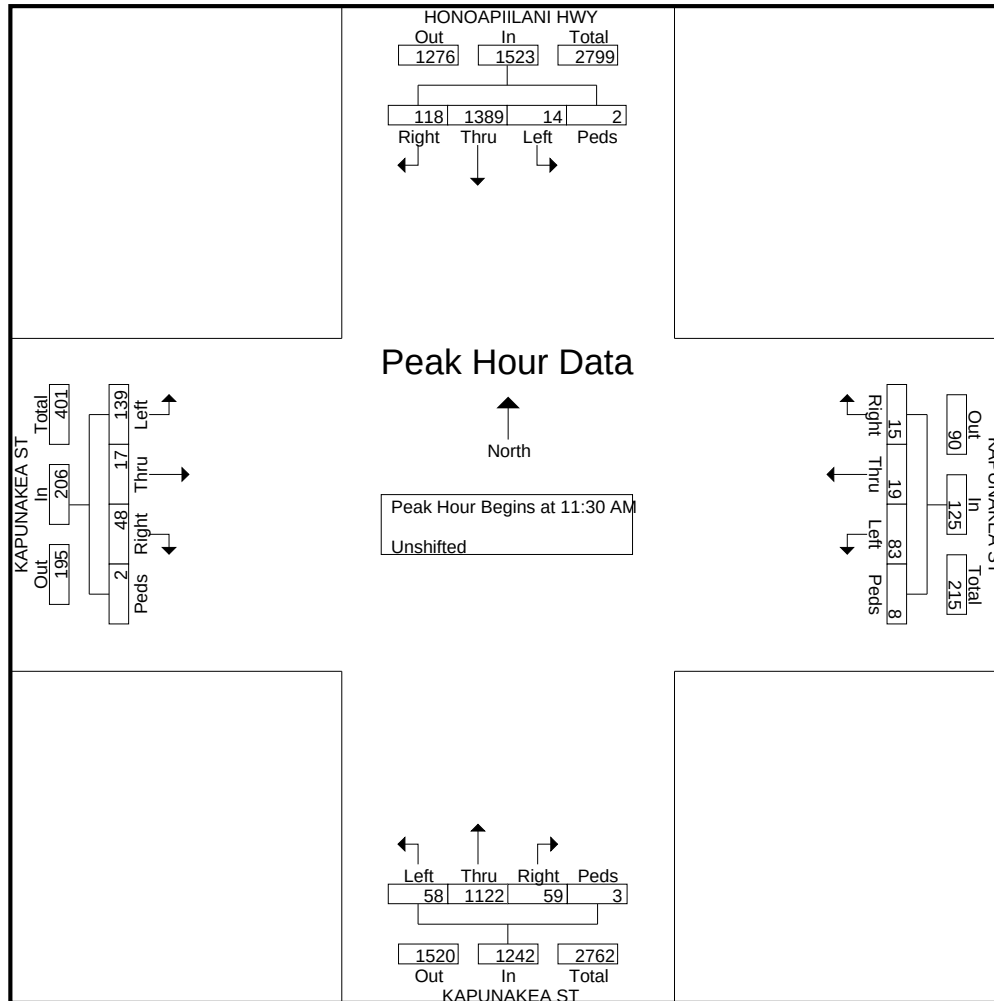
File Name : WE\_Honoapiilani Hwy - Kapunakea St

Site Code : 00000000

Start Date : 1/21/2017

Page No : 2

|                                                                   | HONOAPIILANI HWY<br>Southbound |            |           |          |            | KAPUNAKEA ST<br>Westbound |          |          |          |            | KAPUNAKEA ST<br>Northbound |            |           |          |            | KAPUNAKEA ST<br>Eastbound |          |           |          |            |            |
|-------------------------------------------------------------------|--------------------------------|------------|-----------|----------|------------|---------------------------|----------|----------|----------|------------|----------------------------|------------|-----------|----------|------------|---------------------------|----------|-----------|----------|------------|------------|
| Start Time                                                        | Left                           | Thru       | Right     | Peds     | App. Total | Left                      | Thru     | Right    | Peds     | App. Total | Left                       | Thru       | Right     | Peds     | App. Total | Left                      | Thru     | Right     | Peds     | App. Total | Int. Total |
| <b>Peak Hour Analysis From 11:30 AM to 12:15 PM - Peak 1 of 1</b> |                                |            |           |          |            |                           |          |          |          |            |                            |            |           |          |            |                           |          |           |          |            |            |
| Peak Hour for Entire Intersection Begins at 11:30 AM              |                                |            |           |          |            |                           |          |          |          |            |                            |            |           |          |            |                           |          |           |          |            |            |
| 11:30 AM                                                          | 4                              | <b>413</b> | <b>35</b> | <b>1</b> | <b>453</b> | 18                        | <b>5</b> | 4        | 0        | 27         | 14                         | 289        | 12        | <b>2</b> | 317        | 32                        | 3        | 14        | 0        | 49         | <b>846</b> |
| 11:45 AM                                                          | <b>7</b>                       | 338        | 28        | 0        | 373        | 21                        | 5        | 1        | 2        | 29         | 11                         | 255        | 7         | 1        | 274        | 37                        | <b>5</b> | 7         | 0        | 49         | 725        |
| 12:00 PM                                                          | 1                              | 304        | 24        | 1        | 330        | <b>22</b>                 | 5        | 1        | <b>6</b> | 34         | <b>21</b>                  | 265        | 15        | 0        | 301        | 31                        | 4        | <b>15</b> | <b>2</b> | 52         | 717        |
| 12:15 PM                                                          | 2                              | 334        | 31        | 0        | 367        | 22                        | 4        | <b>9</b> | 0        | <b>35</b>  | 12                         | <b>313</b> | <b>25</b> | 0        | <b>350</b> | <b>39</b>                 | 5        | 12        | 0        | <b>56</b>  | 808        |
| Total Volume                                                      | 14                             | 1389       | 118       | 2        | 1523       | 83                        | 19       | 15       | 8        | 125        | 58                         | 1122       | 59        | 3        | 1242       | 139                       | 17       | 48        | 2        | 206        | 3096       |
| % App. Total                                                      | 0.9                            | 91.2       | 7.7       | 0.1      |            | 66.4                      | 15.2     | 12       | 6.4      |            | 4.7                        | 90.3       | 4.8       | 0.2      |            | 67.5                      | 8.3      | 23.3      | 1        |            |            |
| PHF                                                               | .500                           | .841       | .843      | .500     | .841       | .943                      | .950     | .417     | .333     | .893       | .690                       | .896       | .590      | .375     | .887       | .891                      | .850     | .800      | .250     | .920       | .915       |



# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : WE\_Honoapiilani Hwy - Keawe St

Site Code : 00000000

Start Date : 1/21/2017

Page No : 1

## Groups Printed- Unshifted

|             | HONOAPIILANI HWY<br>Southbound |      |       |      | KEAWE ST<br>Westbound |      |       |      | HONOAPIILANI HWY<br>Northbound |      |       |      | KEAWE ST<br>Eastbound |      |       |      |            |
|-------------|--------------------------------|------|-------|------|-----------------------|------|-------|------|--------------------------------|------|-------|------|-----------------------|------|-------|------|------------|
| Start Time  | Left                           | Thru | Right | Peds | Left                  | Thru | Right | Peds | Left                           | Thru | Right | Peds | Left                  | Thru | Right | Peds | Int. Total |
| 11:00 AM    | 76                             | 248  | 25    | 5    | 44                    | 21   | 93    | 1    | 12                             | 182  | 50    | 1    | 8                     | 24   | 27    | 0    | 817        |
| 11:15 AM    | 88                             | 275  | 26    | 8    | 39                    | 15   | 74    | 3    | 25                             | 200  | 48    | 1    | 9                     | 27   | 14    | 0    | 852        |
| 11:30 AM    | 92                             | 270  | 28    | 3    | 39                    | 16   | 91    | 5    | 32                             | 186  | 47    | 2    | 17                    | 31   | 30    | 0    | 889        |
| 11:45 AM    | 93                             | 230  | 27    | 12   | 38                    | 29   | 87    | 5    | 28                             | 183  | 76    | 4    | 13                    | 35   | 29    | 0    | 889        |
| Total       | 349                            | 1023 | 106   | 28   | 160                   | 81   | 345   | 14   | 97                             | 751  | 221   | 8    | 47                    | 117  | 100   | 0    | 3447       |
| 12:00 PM    | 81                             | 216  | 20    | 4    | 59                    | 25   | 93    | 0    | 20                             | 206  | 69    | 2    | 7                     | 22   | 35    | 1    | 860        |
| 12:15 PM    | 80                             | 236  | 14    | 8    | 55                    | 23   | 110   | 1    | 28                             | 204  | 64    | 4    | 14                    | 24   | 30    | 1    | 896        |
| 12:30 PM    | 80                             | 215  | 11    | 7    | 34                    | 29   | 104   | 4    | 27                             | 249  | 62    | 1    | 12                    | 32   | 24    | 0    | 891        |
| 12:45 PM    | 64                             | 203  | 14    | 3    | 55                    | 25   | 102   | 0    | 19                             | 212  | 65    | 1    | 11                    | 18   | 17    | 2    | 811        |
| Total       | 305                            | 870  | 59    | 22   | 203                   | 102  | 409   | 5    | 94                             | 871  | 260   | 8    | 44                    | 96   | 106   | 4    | 3458       |
| Grand Total | 654                            | 1893 | 165   | 50   | 363                   | 183  | 754   | 19   | 191                            | 1622 | 481   | 16   | 91                    | 213  | 206   | 4    | 6905       |
| Apprch %    | 23.7                           | 68.5 | 6     | 1.8  | 27.5                  | 13.9 | 57.2  | 1.4  | 8.3                            | 70.2 | 20.8  | 0.7  | 17.7                  | 41.4 | 40.1  | 0.8  |            |
| Total %     | 9.5                            | 27.4 | 2.4   | 0.7  | 5.3                   | 2.7  | 10.9  | 0.3  | 2.8                            | 23.5 | 7     | 0.2  | 1.3                   | 3.1  | 3     | 0.1  |            |

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

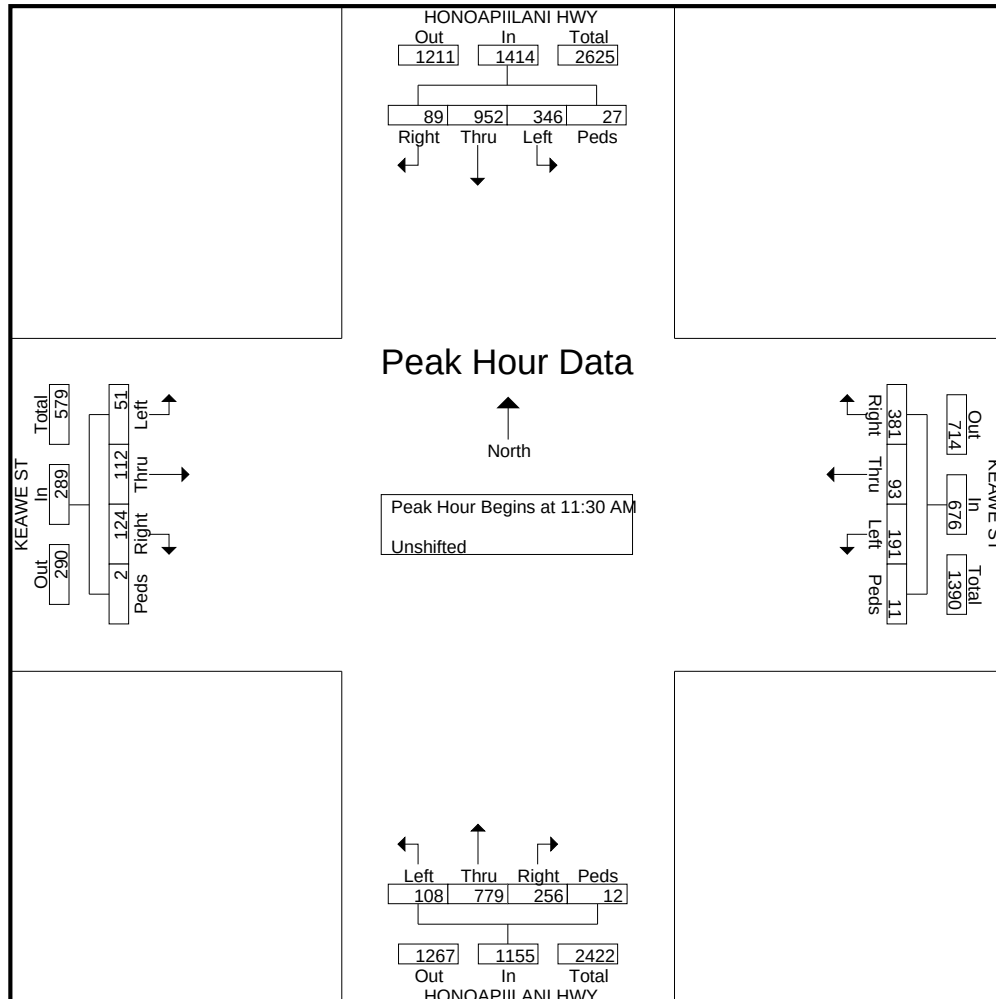
File Name : WE\_Honoapiilani Hwy - Keawe St

Site Code : 00000000

Start Date : 1/21/2017

Page No : 2

|                                                                   | HONOAPIILANI HWY<br>Southbound |      |       |      |            | KEAWE ST<br>Westbound |      |       |      |            | HONOAPIILANI HWY<br>Northbound |      |       |      |            | KEAWE ST<br>Eastbound |      |       |      |            |            |
|-------------------------------------------------------------------|--------------------------------|------|-------|------|------------|-----------------------|------|-------|------|------------|--------------------------------|------|-------|------|------------|-----------------------|------|-------|------|------------|------------|
| Start Time                                                        | Left                           | Thru | Right | Peds | App. Total | Left                  | Thru | Right | Peds | App. Total | Left                           | Thru | Right | Peds | App. Total | Left                  | Thru | Right | Peds | App. Total | Int. Total |
| <b>Peak Hour Analysis From 11:30 AM to 12:15 PM - Peak 1 of 1</b> |                                |      |       |      |            |                       |      |       |      |            |                                |      |       |      |            |                       |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 11:30 AM              |                                |      |       |      |            |                       |      |       |      |            |                                |      |       |      |            |                       |      |       |      |            |            |
| 11:30 AM                                                          | 92                             | 270  | 28    | 3    | 393        | 39                    | 16   | 91    | 5    | 151        | 32                             | 186  | 47    | 2    | 267        | 17                    | 31   | 30    | 0    | 78         | 889        |
| 11:45 AM                                                          | 93                             | 230  | 27    | 12   | 362        | 38                    | 29   | 87    | 5    | 159        | 28                             | 183  | 76    | 4    | 291        | 13                    | 35   | 29    | 0    | 77         | 889        |
| 12:00 PM                                                          | 81                             | 216  | 20    | 4    | 321        | 59                    | 25   | 93    | 0    | 177        | 20                             | 206  | 69    | 2    | 297        | 7                     | 22   | 35    | 1    | 65         | 860        |
| 12:15 PM                                                          | 80                             | 236  | 14    | 8    | 338        | 55                    | 23   | 110   | 1    | 189        | 28                             | 204  | 64    | 4    | 300        | 14                    | 24   | 30    | 1    | 69         | 896        |
| Total Volume                                                      | 346                            | 952  | 89    | 27   | 1414       | 191                   | 93   | 381   | 11   | 676        | 108                            | 779  | 256   | 12   | 1155       | 51                    | 112  | 124   | 2    | 289        | 3534       |
| % App. Total                                                      | 24.5                           | 67.3 | 6.3   | 1.9  |            | 28.3                  | 13.8 | 56.4  | 1.6  |            | 9.4                            | 67.4 | 22.2  | 1    |            | 17.6                  | 38.8 | 42.9  | 0.7  |            |            |
| PHF                                                               | .930                           | .881 | .795  | .563 | .899       | .809                  | .802 | .866  | .550 | .894       | .844                           | .945 | .842  | .750 | .963       | .750                  | .800 | .886  | .500 | .926       | .986       |





---

---

## **APPENDIX B**

### **LEVEL OF SERVICE CRITERIA**

---

---

## APPENDIX B – LEVEL OF SERVICE (LOS) CRITERIA

### VEHICULAR LEVEL OF SERVICE FOR SIGNALIZED INTERSECTIONS (HCM 2010)

Level of service for vehicles at signalized intersections is directly related to delay values and is assigned on that basis. Level of Service is a measure of the acceptability of delay values to motorists at a given intersection. The criteria are given in the table below.

Level-of Service Criteria for Signalized Intersections

| Level of Service | Control Delay per<br>Vehicle (sec./veh.) |
|------------------|------------------------------------------|
| A                | < 10.0                                   |
| B                | >10.0 and ≤ 20.0                         |
| C                | >20.0 and ≤ 35.0                         |
| D                | >35.0 and ≤ 55.0                         |
| E                | >55.0 and ≤ 80.0                         |
| F                | > 80.0                                   |

Delay is a complex measure, and is dependent on a number of variables, including the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group or approach in question.

### VEHICULAR LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS (HCM 2010)

The level of service criteria for vehicles at unsignalized intersections is defined as the average control delay, in seconds per vehicle.

LOS delay threshold values are lower for two-way stop-controlled (TWSC) and all-way stop-controlled (AWSC) intersections than those of signalized intersections. This is because more vehicles pass through signalized intersections, and therefore, drivers expect and tolerate greater delays. While the criteria for level of service for TWSC and AWSC intersections are the same, procedures to calculate the average total delay may differ.

Level of Service Criteria for Two-Way Stop-Controlled Intersections

| Level of<br>Service | Average Control Delay<br>(sec/veh) |
|---------------------|------------------------------------|
| A                   | ≤ 10                               |
| B                   | >10 and ≤15                        |
| C                   | >15 and ≤25                        |
| D                   | >25 and ≤35                        |
| E                   | >35 and ≤50                        |
| F                   | > 50                               |





---

---

## APPENDIX C

### LEVEL OF SERVICE CALCULATIONS

---

---



---

## **APPENDIX C**

### **LEVEL OF SERVICE CALCULATIONS**

- Existing AM Peak
-

# HCM 2010 Signalized Intersection Summary

## 1: Honoapiilani Highway & Napilihau Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 48                                                                                | 37                                                                                | 271                                                                               | 52                                                                                | 28                                                                                | 10                                                                                | 202                                                                                | 204                                                                                 | 84                                                                                  | 5                                                                                   | 117                                                                                 | 30                                                                                  |
| Future Volume (veh/h)        | 48                                                                                | 37                                                                                | 271                                                                               | 52                                                                                | 28                                                                                | 10                                                                                | 202                                                                                | 204                                                                                 | 84                                                                                  | 5                                                                                   | 117                                                                                 | 30                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                  | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.99                                                                              | 0.99                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 52                                                                                | 40                                                                                | 37                                                                                | 57                                                                                | 30                                                                                | 8                                                                                 | 220                                                                                | 222                                                                                 | 77                                                                                  | 5                                                                                   | 127                                                                                 | 8                                                                                   |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 1                                                                                   | 0                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 257                                                                               | 135                                                                               | 225                                                                               | 239                                                                               | 86                                                                                | 16                                                                                | 298                                                                                | 567                                                                                 | 197                                                                                 | 7                                                                                   | 493                                                                                 | 419                                                                                 |
| Arrive On Green              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.17                                                                               | 0.43                                                                                | 0.43                                                                                | 0.00                                                                                | 0.26                                                                                | 0.26                                                                                |
| Sat Flow, veh/h              | 747                                                                               | 941                                                                               | 1568                                                                              | 604                                                                               | 600                                                                               | 111                                                                               | 1774                                                                               | 1323                                                                                | 459                                                                                 | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 92                                                                                | 0                                                                                 | 37                                                                                | 95                                                                                | 0                                                                                 | 0                                                                                 | 220                                                                                | 0                                                                                   | 299                                                                                 | 5                                                                                   | 127                                                                                 | 8                                                                                   |
| Grp Sat Flow(s),veh/h/ln     | 1688                                                                              | 0                                                                                 | 1568                                                                              | 1314                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                               | 0                                                                                   | 1782                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.8                                                                               | 1.1                                                                               | 0.0                                                                               | 0.0                                                                               | 4.4                                                                                | 0.0                                                                                 | 4.4                                                                                 | 0.1                                                                                 | 2.0                                                                                 | 0.1                                                                                 |
| Cycle Q Clear(g_c), s        | 1.7                                                                               | 0.0                                                                               | 0.8                                                                               | 2.8                                                                               | 0.0                                                                               | 0.0                                                                               | 4.4                                                                                | 0.0                                                                                 | 4.4                                                                                 | 0.1                                                                                 | 2.0                                                                                 | 0.1                                                                                 |
| Prop In Lane                 | 0.57                                                                              |                                                                                   | 1.00                                                                              | 0.60                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                               |                                                                                     | 0.26                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 392                                                                               | 0                                                                                 | 225                                                                               | 341                                                                               | 0                                                                                 | 0                                                                                 | 298                                                                                | 0                                                                                   | 764                                                                                 | 7                                                                                   | 493                                                                                 | 419                                                                                 |
| V/C Ratio(X)                 | 0.23                                                                              | 0.00                                                                              | 0.16                                                                              | 0.28                                                                              | 0.00                                                                              | 0.00                                                                              | 0.74                                                                               | 0.00                                                                                | 0.39                                                                                | 0.69                                                                                | 0.26                                                                                | 0.02                                                                                |
| Avail Cap(c_a), veh/h        | 1147                                                                              | 0                                                                                 | 996                                                                               | 1062                                                                              | 0                                                                                 | 0                                                                                 | 1409                                                                               | 0                                                                                   | 3726                                                                                | 704                                                                                 | 3156                                                                                | 2683                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                               | 0.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 14.6                                                                              | 0.0                                                                               | 14.2                                                                              | 15.0                                                                              | 0.0                                                                               | 0.0                                                                               | 14.9                                                                               | 0.0                                                                                 | 7.4                                                                                 | 18.8                                                                                | 11.0                                                                                | 10.3                                                                                |
| Incr Delay (d2), s/veh       | 0.3                                                                               | 0.0                                                                               | 0.3                                                                               | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 3.6                                                                                | 0.0                                                                                 | 0.7                                                                                 | 78.2                                                                                | 0.6                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.9                                                                               | 0.0                                                                               | 0.4                                                                               | 1.0                                                                               | 0.0                                                                               | 0.0                                                                               | 2.4                                                                                | 0.0                                                                                 | 2.2                                                                                 | 0.2                                                                                 | 1.1                                                                                 | 0.1                                                                                 |
| LnGrp Delay(d),s/veh         | 14.9                                                                              | 0.0                                                                               | 14.5                                                                              | 15.5                                                                              | 0.0                                                                               | 0.0                                                                               | 18.5                                                                               | 0.0                                                                                 | 8.1                                                                                 | 97.0                                                                                | 11.5                                                                                | 10.3                                                                                |
| LnGrp LOS                    | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                 |                                                                                   |                                                                                   | B                                                                                  |                                                                                     | A                                                                                   | F                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 129                                                                               |                                                                                   |                                                                                   | 95                                                                                |                                                                                   |                                                                                    | 519                                                                                 |                                                                                     |                                                                                     | 140                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 14.8                                                                              |                                                                                   |                                                                                   | 15.5                                                                              |                                                                                   |                                                                                    | 12.5                                                                                |                                                                                     |                                                                                     | 14.5                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.2                                                                               | 22.2                                                                              |                                                                                   | 10.4                                                                              | 11.3                                                                              | 16.0                                                                              |                                                                                    | 10.4                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 79.0                                                                              |                                                                                   | 24.0                                                                              | 30.0                                                                              | 64.0                                                                              |                                                                                    | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.1                                                                               | 6.4                                                                               |                                                                                   | 3.7                                                                               | 6.4                                                                               | 4.0                                                                               |                                                                                    | 4.8                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 4.1                                                                               |                                                                                   | 0.5                                                                               | 0.6                                                                               | 1.6                                                                               |                                                                                    | 0.4                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 13.5                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## HCM 2010 Signalized Intersection Summary

### 2: Honoapiilani Highway & Hoohui Road

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 58                                                                                | 3                                                                                 | 163                                                                               | 84                                                                                | 18                                                                                | 13                                                                                | 123                                                                                 | 453                                                                                 | 13                                                                                  | 9                                                                                   | 432                                                                                 | 61                                                                                  |
| Future Volume (veh/h)        | 58                                                                                | 3                                                                                 | 163                                                                               | 84                                                                                | 18                                                                                | 13                                                                                | 123                                                                                 | 453                                                                                 | 13                                                                                  | 9                                                                                   | 432                                                                                 | 61                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                              |                                                                                   | 0.97                                                                              | 0.98                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 0.99                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 63                                                                                | 3                                                                                 | 22                                                                                | 91                                                                                | 20                                                                                | 2                                                                                 | 134                                                                                 | 492                                                                                 | 0                                                                                   | 10                                                                                  | 470                                                                                 | 25                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 403                                                                               | 16                                                                                | 304                                                                               | 363                                                                               | 327                                                                               | 33                                                                                | 444                                                                                 | 809                                                                                 | 687                                                                                 | 384                                                                                 | 648                                                                                 | 546                                                                                 |
| Arrive On Green              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.09                                                                                | 0.43                                                                                | 0.00                                                                                | 0.01                                                                                | 0.35                                                                                | 0.35                                                                                |
| Sat Flow, veh/h              | 1240                                                                              | 79                                                                                | 1543                                                                              | 1351                                                                              | 1662                                                                              | 166                                                                               | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1570                                                                                |
| Grp Volume(v), veh/h         | 66                                                                                | 0                                                                                 | 22                                                                                | 91                                                                                | 0                                                                                 | 22                                                                                | 134                                                                                 | 492                                                                                 | 0                                                                                   | 10                                                                                  | 470                                                                                 | 25                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1320                                                                              | 0                                                                                 | 1543                                                                              | 1351                                                                              | 0                                                                                 | 1828                                                                              | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1570                                                                                |
| Q Serve(g_s), s              | 1.7                                                                               | 0.0                                                                               | 0.5                                                                               | 2.7                                                                               | 0.0                                                                               | 0.4                                                                               | 2.0                                                                                 | 9.0                                                                                 | 0.0                                                                                 | 0.2                                                                                 | 9.8                                                                                 | 0.5                                                                                 |
| Cycle Q Clear(g_c), s        | 2.1                                                                               | 0.0                                                                               | 0.5                                                                               | 4.9                                                                               | 0.0                                                                               | 0.4                                                                               | 2.0                                                                                 | 9.0                                                                                 | 0.0                                                                                 | 0.2                                                                                 | 9.8                                                                                 | 0.5                                                                                 |
| Prop In Lane                 | 0.95                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.09                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 419                                                                               | 0                                                                                 | 304                                                                               | 363                                                                               | 0                                                                                 | 360                                                                               | 444                                                                                 | 809                                                                                 | 687                                                                                 | 384                                                                                 | 648                                                                                 | 546                                                                                 |
| V/C Ratio(X)                 | 0.16                                                                              | 0.00                                                                              | 0.07                                                                              | 0.25                                                                              | 0.00                                                                              | 0.06                                                                              | 0.30                                                                                | 0.61                                                                                | 0.00                                                                                | 0.03                                                                                | 0.73                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h        | 921                                                                               | 0                                                                                 | 871                                                                               | 859                                                                               | 0                                                                                 | 1031                                                                              | 877                                                                                 | 2144                                                                                | 1822                                                                                | 971                                                                                 | 2144                                                                                | 1806                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 0.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 15.3                                                                              | 0.0                                                                               | 14.5                                                                              | 17.2                                                                              | 0.0                                                                               | 14.5                                                                              | 8.5                                                                                 | 9.6                                                                                 | 0.0                                                                                 | 9.6                                                                                 | 12.6                                                                                | 9.6                                                                                 |
| Incr Delay (d2), s/veh       | 0.2                                                                               | 0.0                                                                               | 0.1                                                                               | 0.4                                                                               | 0.0                                                                               | 0.1                                                                               | 0.4                                                                                 | 0.7                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 1.6                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.7                                                                               | 0.0                                                                               | 0.2                                                                               | 1.0                                                                               | 0.0                                                                               | 0.2                                                                               | 1.0                                                                                 | 4.7                                                                                 | 0.0                                                                                 | 0.1                                                                                 | 5.2                                                                                 | 0.2                                                                                 |
| LnGrp Delay(d),s/veh         | 15.4                                                                              | 0.0                                                                               | 14.6                                                                              | 17.6                                                                              | 0.0                                                                               | 14.5                                                                              | 8.8                                                                                 | 10.4                                                                                | 0.0                                                                                 | 9.6                                                                                 | 14.2                                                                                | 9.6                                                                                 |
| LnGrp LOS                    | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                 |                                                                                   | B                                                                                 | A                                                                                   | B                                                                                   |                                                                                     | A                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 88                                                                                |                                                                                   |                                                                                   | 113                                                                               |                                                                                   |                                                                                     | 626                                                                                 |                                                                                     |                                                                                     | 505                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 15.2                                                                              |                                                                                   |                                                                                   | 17.0                                                                              |                                                                                   |                                                                                     | 10.1                                                                                |                                                                                     |                                                                                     | 13.9                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.3                                                                               | 25.2                                                                              |                                                                                   | 13.7                                                                              | 9.2                                                                               | 21.4                                                                              |                                                                                     | 13.7                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 51.0                                                                              |                                                                                   | 25.0                                                                              | 15.0                                                                              | 51.0                                                                              |                                                                                     | 25.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.2                                                                               | 11.0                                                                              |                                                                                   | 4.1                                                                               | 4.0                                                                               | 11.8                                                                              |                                                                                     | 6.9                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 3.4                                                                               |                                                                                   | 0.4                                                                               | 0.2                                                                               | 3.3                                                                               |                                                                                     | 0.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 12.4                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 3: Honoapiilani Highway & Akahele Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 39                                                                                | 1                                                                                 | 113                                                                               | 5                                                                                 | 1                                                                                 | 4                                                                                 | 52                                                                                 | 527                                                                                 | 11                                                                                  | 5                                                                                   | 612                                                                                 | 28                                                                                  |
| Future Volume (veh/h)        | 39                                                                                | 1                                                                                 | 113                                                                               | 5                                                                                 | 1                                                                                 | 4                                                                                 | 52                                                                                 | 527                                                                                 | 11                                                                                  | 5                                                                                   | 612                                                                                 | 28                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                  | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 0.99                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 42                                                                                | 1                                                                                 | 13                                                                                | 5                                                                                 | 1                                                                                 | 1                                                                                 | 57                                                                                 | 573                                                                                 | 7                                                                                   | 5                                                                                   | 665                                                                                 | 14                                                                                  |
| Adj No. of Lanes             | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 62                                                                                | 14                                                                                | 182                                                                               | 10                                                                                | 175                                                                               | 147                                                                               | 72                                                                                 | 899                                                                                 | 764                                                                                 | 7                                                                                   | 831                                                                                 | 701                                                                                 |
| Arrive On Green              | 0.03                                                                              | 0.12                                                                              | 0.12                                                                              | 0.01                                                                              | 0.09                                                                              | 0.09                                                                              | 0.04                                                                               | 0.48                                                                                | 0.48                                                                                | 0.00                                                                                | 0.45                                                                                | 0.45                                                                                |
| Sat Flow, veh/h              | 1774                                                                              | 113                                                                               | 1472                                                                              | 1774                                                                              | 1863                                                                              | 1567                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1571                                                                                |
| Grp Volume(v), veh/h         | 42                                                                                | 0                                                                                 | 14                                                                                | 5                                                                                 | 1                                                                                 | 1                                                                                 | 57                                                                                 | 573                                                                                 | 7                                                                                   | 5                                                                                   | 665                                                                                 | 14                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1774                                                                              | 0                                                                                 | 1585                                                                              | 1774                                                                              | 1863                                                                              | 1567                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1571                                                                                |
| Q Serve(g_s), s              | 1.2                                                                               | 0.0                                                                               | 0.4                                                                               | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 1.7                                                                                | 12.0                                                                                | 0.1                                                                                 | 0.1                                                                                 | 16.0                                                                                | 0.3                                                                                 |
| Cycle Q Clear(g_c), s        | 1.2                                                                               | 0.0                                                                               | 0.4                                                                               | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 1.7                                                                                | 12.0                                                                                | 0.1                                                                                 | 0.1                                                                                 | 16.0                                                                                | 0.3                                                                                 |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 0.93                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 62                                                                                | 0                                                                                 | 196                                                                               | 10                                                                                | 175                                                                               | 147                                                                               | 72                                                                                 | 899                                                                                 | 764                                                                                 | 7                                                                                   | 831                                                                                 | 701                                                                                 |
| V/C Ratio(X)                 | 0.68                                                                              | 0.00                                                                              | 0.07                                                                              | 0.53                                                                              | 0.01                                                                              | 0.01                                                                              | 0.79                                                                               | 0.64                                                                                | 0.01                                                                                | 0.70                                                                                | 0.80                                                                                | 0.02                                                                                |
| Avail Cap(c_a), veh/h        | 682                                                                               | 0                                                                                 | 639                                                                               | 682                                                                               | 751                                                                               | 632                                                                               | 852                                                                                | 2326                                                                                | 1977                                                                                | 852                                                                                 | 2326                                                                                | 1961                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 24.8                                                                              | 0.0                                                                               | 20.2                                                                              | 25.8                                                                              | 21.4                                                                              | 21.4                                                                              | 24.8                                                                               | 10.1                                                                                | 7.0                                                                                 | 25.9                                                                                | 12.4                                                                                | 8.1                                                                                 |
| Incr Delay (d2), s/veh       | 12.1                                                                              | 0.0                                                                               | 0.2                                                                               | 38.4                                                                              | 0.0                                                                               | 0.0                                                                               | 17.4                                                                               | 0.8                                                                                 | 0.0                                                                                 | 80.2                                                                                | 1.8                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.8                                                                               | 0.0                                                                               | 0.2                                                                               | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 1.2                                                                                | 6.2                                                                                 | 0.1                                                                                 | 0.2                                                                                 | 8.6                                                                                 | 0.1                                                                                 |
| LnGrp Delay(d),s/veh         | 36.9                                                                              | 0.0                                                                               | 20.3                                                                              | 64.3                                                                              | 21.4                                                                              | 21.4                                                                              | 42.1                                                                               | 10.8                                                                                | 7.0                                                                                 | 106.1                                                                               | 14.3                                                                                | 8.1                                                                                 |
| LnGrp LOS                    | D                                                                                 |                                                                                   | C                                                                                 | E                                                                                 | C                                                                                 | C                                                                                 | D                                                                                  | B                                                                                   | A                                                                                   | F                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 56                                                                                |                                                                                   |                                                                                   | 7                                                                                 |                                                                                   |                                                                                    | 637                                                                                 |                                                                                     |                                                                                     | 684                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 32.8                                                                              |                                                                                   |                                                                                   | 52.0                                                                              |                                                                                   |                                                                                    | 13.6                                                                                |                                                                                     |                                                                                     | 14.8                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.2                                                                               | 30.1                                                                              | 5.3                                                                               | 11.4                                                                              | 7.1                                                                               | 28.2                                                                              | 6.8                                                                                | 9.9                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              | 25.0                                                                              | 65.0                                                                              | 20.0                                                                               | 21.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.1                                                                               | 14.0                                                                              | 2.1                                                                               | 2.4                                                                               | 3.7                                                                               | 18.0                                                                              | 3.2                                                                                | 2.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 4.2                                                                               | 0.0                                                                               | 0.0                                                                               | 0.1                                                                               | 5.2                                                                               | 0.1                                                                                | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 15.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 4: Honoapiilani Highway & Lower Honoapiilani Road

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 30                                                                                | 7                                                                                 | 433                                                                               | 17                                                                                | 3                                                                                 | 0                                                                                 | 287                                                                                 | 592                                                                                 | 38                                                                                  | 8                                                                                   | 691                                                                                 | 10                                                                                  |
| Future Volume (veh/h)        | 30                                                                                | 7                                                                                 | 433                                                                               | 17                                                                                | 3                                                                                 | 0                                                                                 | 287                                                                                 | 592                                                                                 | 38                                                                                  | 8                                                                                   | 691                                                                                 | 10                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 1.00                                                                              | 0.99                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 33                                                                                | 8                                                                                 | 0                                                                                 | 18                                                                                | 3                                                                                 | 0                                                                                 | 312                                                                                 | 643                                                                                 | 40                                                                                  | 9                                                                                   | 751                                                                                 | 3                                                                                   |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 218                                                                               | 23                                                                                | 112                                                                               | 224                                                                               | 24                                                                                | 0                                                                                 | 389                                                                                 | 2069                                                                                | 129                                                                                 | 13                                                                                  | 1413                                                                                | 632                                                                                 |
| Arrive On Green              | 0.09                                                                              | 0.07                                                                              | 0.00                                                                              | 0.09                                                                              | 0.07                                                                              | 0.00                                                                              | 0.22                                                                                | 0.61                                                                                | 0.61                                                                                | 0.01                                                                                | 0.40                                                                                | 0.40                                                                                |
| Sat Flow, veh/h              | 1183                                                                              | 326                                                                               | 1583                                                                              | 1200                                                                              | 338                                                                               | 0                                                                                 | 1774                                                                                | 3385                                                                                | 210                                                                                 | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 41                                                                                | 0                                                                                 | 0                                                                                 | 21                                                                                | 0                                                                                 | 0                                                                                 | 312                                                                                 | 336                                                                                 | 347                                                                                 | 9                                                                                   | 751                                                                                 | 3                                                                                   |
| Grp Sat Flow(s),veh/h/ln     | 1508                                                                              | 0                                                                                 | 1583                                                                              | 1538                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1826                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 0.6                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 8.0                                                                                 | 4.4                                                                                 | 4.4                                                                                 | 0.2                                                                                 | 7.8                                                                                 | 0.1                                                                                 |
| Cycle Q Clear(g_c), s        | 1.1                                                                               | 0.0                                                                               | 0.0                                                                               | 0.5                                                                               | 0.0                                                                               | 0.0                                                                               | 8.0                                                                                 | 4.4                                                                                 | 4.4                                                                                 | 0.2                                                                                 | 7.8                                                                                 | 0.1                                                                                 |
| Prop In Lane                 | 0.80                                                                              |                                                                                   | 1.00                                                                              | 0.86                                                                              |                                                                                   | 0.00                                                                              | 1.00                                                                                |                                                                                     | 0.12                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 273                                                                               | 0                                                                                 | 112                                                                               | 279                                                                               | 0                                                                                 | 0                                                                                 | 389                                                                                 | 1082                                                                                | 1116                                                                                | 13                                                                                  | 1413                                                                                | 632                                                                                 |
| V/C Ratio(X)                 | 0.15                                                                              | 0.00                                                                              | 0.00                                                                              | 0.08                                                                              | 0.00                                                                              | 0.00                                                                              | 0.80                                                                                | 0.31                                                                                | 0.31                                                                                | 0.72                                                                                | 0.53                                                                                | 0.00                                                                                |
| Avail Cap(c_a), veh/h        | 778                                                                               | 0                                                                                 | 656                                                                               | 926                                                                               | 0                                                                                 | 0                                                                                 | 2426                                                                                | 2713                                                                                | 2799                                                                                | 2426                                                                                | 5427                                                                                | 2428                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 21.0                                                                              | 0.0                                                                               | 0.0                                                                               | 20.7                                                                              | 0.0                                                                               | 0.0                                                                               | 17.9                                                                                | 4.5                                                                                 | 4.5                                                                                 | 23.9                                                                                | 11.1                                                                                | 8.7                                                                                 |
| Incr Delay (d2), s/veh       | 0.3                                                                               | 0.0                                                                               | 0.0                                                                               | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 1.5                                                                                 | 0.3                                                                                 | 0.3                                                                                 | 24.6                                                                                | 0.7                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.5                                                                               | 0.0                                                                               | 0.0                                                                               | 0.3                                                                               | 0.0                                                                               | 0.0                                                                               | 4.1                                                                                 | 2.2                                                                                 | 2.2                                                                                 | 0.2                                                                                 | 3.9                                                                                 | 0.0                                                                                 |
| LnGrp Delay(d),s/veh         | 21.2                                                                              | 0.0                                                                               | 0.0                                                                               | 20.8                                                                              | 0.0                                                                               | 0.0                                                                               | 19.3                                                                                | 4.8                                                                                 | 4.8                                                                                 | 48.5                                                                                | 11.7                                                                                | 8.7                                                                                 |
| LnGrp LOS                    | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | B                                                                                   | A                                                                                   | A                                                                                   | D                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 41                                                                                |                                                                                   |                                                                                   | 21                                                                                |                                                                                   |                                                                                     | 995                                                                                 |                                                                                     |                                                                                     | 763                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 21.2                                                                              |                                                                                   |                                                                                   | 20.8                                                                              |                                                                                   |                                                                                     | 9.4                                                                                 |                                                                                     |                                                                                     | 12.1                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 14.6                                                                              | 25.3                                                                              |                                                                                   | 8.4                                                                               | 4.3                                                                               | 35.5                                                                              |                                                                                     | 8.4                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 66.0                                                                              | 74.0                                                                              |                                                                                   | 25.0                                                                              | 66.0                                                                              | 74.0                                                                              |                                                                                     | 20.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 10.0                                                                              | 9.8                                                                               |                                                                                   | 2.5                                                                               | 2.2                                                                               | 6.4                                                                               |                                                                                     | 3.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.7                                                                               | 9.5                                                                               |                                                                                   | 0.0                                                                               | 0.0                                                                               | 7.5                                                                               |                                                                                     | 0.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 10.9                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 5: Honoapiilani Highway & Kai Malina Parkway/Halawai Drive

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 16                                                                                | 0                                                                                 | 33                                                                                | 8                                                                                 | 1                                                                                 | 6                                                                                 | 64                                                                                  | 974                                                                                 | 16                                                                                  | 14                                                                                  | 1129                                                                                | 38                                                                                  |
| Future Volume (veh/h)        | 16                                                                                | 0                                                                                 | 33                                                                                | 8                                                                                 | 1                                                                                 | 6                                                                                 | 64                                                                                  | 974                                                                                 | 16                                                                                  | 14                                                                                  | 1129                                                                                | 38                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 17                                                                                | 0                                                                                 | 1                                                                                 | 9                                                                                 | 1                                                                                 | 2                                                                                 | 70                                                                                  | 1059                                                                                | 16                                                                                  | 15                                                                                  | 1227                                                                                | 26                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 194                                                                               | 0                                                                                 | 54                                                                                | 156                                                                               | 3                                                                                 | 7                                                                                 | 88                                                                                  | 2420                                                                                | 37                                                                                  | 20                                                                                  | 2264                                                                                | 1013                                                                                |
| Arrive On Green              | 0.05                                                                              | 0.00                                                                              | 0.03                                                                              | 0.05                                                                              | 0.03                                                                              | 0.03                                                                              | 0.05                                                                                | 0.68                                                                                | 0.68                                                                                | 0.01                                                                                | 0.64                                                                                | 0.64                                                                                |
| Sat Flow, veh/h              | 1524                                                                              | 0                                                                                 | 1583                                                                              | 913                                                                               | 101                                                                               | 203                                                                               | 1774                                                                                | 3569                                                                                | 54                                                                                  | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 17                                                                                | 0                                                                                 | 1                                                                                 | 12                                                                                | 0                                                                                 | 0                                                                                 | 70                                                                                  | 525                                                                                 | 550                                                                                 | 15                                                                                  | 1227                                                                                | 26                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1524                                                                              | 0                                                                                 | 1583                                                                              | 1217                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1853                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 2.0                                                                                 | 6.9                                                                                 | 6.9                                                                                 | 0.4                                                                                 | 9.7                                                                                 | 0.3                                                                                 |
| Cycle Q Clear(g_c), s        | 0.5                                                                               | 0.0                                                                               | 0.0                                                                               | 0.9                                                                               | 0.0                                                                               | 0.0                                                                               | 2.0                                                                                 | 6.9                                                                                 | 6.9                                                                                 | 0.4                                                                                 | 9.7                                                                                 | 0.3                                                                                 |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.75                                                                              |                                                                                   | 0.17                                                                              | 1.00                                                                                |                                                                                     | 0.03                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 224                                                                               | 0                                                                                 | 54                                                                                | 190                                                                               | 0                                                                                 | 0                                                                                 | 88                                                                                  | 1200                                                                                | 1257                                                                                | 20                                                                                  | 2264                                                                                | 1013                                                                                |
| V/C Ratio(X)                 | 0.08                                                                              | 0.00                                                                              | 0.02                                                                              | 0.06                                                                              | 0.00                                                                              | 0.00                                                                              | 0.79                                                                                | 0.44                                                                                | 0.44                                                                                | 0.75                                                                                | 0.54                                                                                | 0.03                                                                                |
| Avail Cap(c_a), veh/h        | 816                                                                               | 0                                                                                 | 720                                                                               | 807                                                                               | 0                                                                                 | 0                                                                                 | 736                                                                                 | 3007                                                                                | 3149                                                                                | 386                                                                                 | 5314                                                                                | 2378                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 23.4                                                                              | 0.0                                                                               | 23.6                                                                              | 23.9                                                                              | 0.0                                                                               | 0.0                                                                               | 23.8                                                                                | 3.7                                                                                 | 3.7                                                                                 | 25.0                                                                                | 5.0                                                                                 | 3.3                                                                                 |
| Incr Delay (d2), s/veh       | 0.1                                                                               | 0.0                                                                               | 0.1                                                                               | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 5.9                                                                                 | 0.5                                                                                 | 0.5                                                                                 | 18.6                                                                                | 0.4                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 1.1                                                                                 | 3.4                                                                                 | 3.5                                                                                 | 0.3                                                                                 | 4.7                                                                                 | 0.1                                                                                 |
| LnGrp Delay(d),s/veh         | 23.4                                                                              | 0.0                                                                               | 23.7                                                                              | 23.9                                                                              | 0.0                                                                               | 0.0                                                                               | 29.7                                                                                | 4.3                                                                                 | 4.2                                                                                 | 43.5                                                                                | 5.5                                                                                 | 3.4                                                                                 |
| LnGrp LOS                    | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                 |                                                                                   |                                                                                   | C                                                                                   | A                                                                                   | A                                                                                   | D                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 18                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 12                                                                                |                                                                                     | 1145                                                                                |                                                                                     | 1268                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 23.4                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 23.9                                                                              |                                                                                     | 5.8                                                                                 |                                                                                     | 5.9                                                                                 |                                                                                     |                                                                                     |
| Approach LOS                 | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   | C                                                                                 |                                                                                     | A                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 6.5                                                                               | 37.4                                                                              |                                                                                   |                                                                                   | 6.7                                                                               | 4.6                                                                               | 39.3                                                                                | 6.7                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                                 | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 21.0                                                                              | 76.0                                                                              |                                                                                   |                                                                                   | 23.0                                                                              | 11.0                                                                              | 86.0                                                                                | 23.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 4.0                                                                               | 11.7                                                                              |                                                                                   |                                                                                   | 2.9                                                                               | 2.4                                                                               | 8.9                                                                                 | 2.5                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 20.7                                                                              |                                                                                   |                                                                                   | 0.0                                                                               | 0.0                                                                               | 15.0                                                                                | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 6.1                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 6: Honoapiilani Highway & Kai Ala Drive/Puukolii Road

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 45                                                                                | 4                                                                                 | 30                                                                                | 39                                                                                | 13                                                                                | 41                                                                                | 102                                                                                 | 965                                                                                 | 54                                                                                  | 24                                                                                  | 1060                                                                                | 37                                                                                  |
| Future Volume (veh/h)        | 45                                                                                | 4                                                                                 | 30                                                                                | 39                                                                                | 13                                                                                | 41                                                                                | 102                                                                                 | 965                                                                                 | 54                                                                                  | 24                                                                                  | 1060                                                                                | 37                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 49                                                                                | 4                                                                                 | 1                                                                                 | 42                                                                                | 14                                                                                | 2                                                                                 | 111                                                                                 | 1049                                                                                | 46                                                                                  | 26                                                                                  | 1152                                                                                | 29                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 149                                                                               | 10                                                                                | 139                                                                               | 110                                                                               | 140                                                                               | 20                                                                                | 132                                                                                 | 2809                                                                                | 1257                                                                                | 39                                                                                  | 2622                                                                                | 1173                                                                                |
| Arrive On Green              | 0.09                                                                              | 0.09                                                                              | 0.09                                                                              | 0.09                                                                              | 0.09                                                                              | 0.09                                                                              | 0.07                                                                                | 0.79                                                                                | 0.79                                                                                | 0.02                                                                                | 0.74                                                                                | 0.74                                                                                |
| Sat Flow, veh/h              | 1188                                                                              | 119                                                                               | 1578                                                                              | 1402                                                                              | 1594                                                                              | 228                                                                               | 1774                                                                                | 3539                                                                                | 1583                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 53                                                                                | 0                                                                                 | 1                                                                                 | 42                                                                                | 0                                                                                 | 16                                                                                | 111                                                                                 | 1049                                                                                | 46                                                                                  | 26                                                                                  | 1152                                                                                | 29                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1307                                                                              | 0                                                                                 | 1578                                                                              | 1402                                                                              | 0                                                                                 | 1822                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 5.3                                                                               | 0.0                                                                               | 0.1                                                                               | 4.6                                                                               | 0.0                                                                               | 1.3                                                                               | 9.6                                                                                 | 13.5                                                                                | 1.0                                                                                 | 2.3                                                                                 | 19.4                                                                                | 0.7                                                                                 |
| Cycle Q Clear(g_c), s        | 6.6                                                                               | 0.0                                                                               | 0.1                                                                               | 11.1                                                                              | 0.0                                                                               | 1.3                                                                               | 9.6                                                                                 | 13.5                                                                                | 1.0                                                                                 | 2.3                                                                                 | 19.4                                                                                | 0.7                                                                                 |
| Prop In Lane                 | 0.92                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.13                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 159                                                                               | 0                                                                                 | 139                                                                               | 110                                                                               | 0                                                                                 | 160                                                                               | 132                                                                                 | 2809                                                                                | 1257                                                                                | 39                                                                                  | 2622                                                                                | 1173                                                                                |
| V/C Ratio(X)                 | 0.33                                                                              | 0.00                                                                              | 0.01                                                                              | 0.38                                                                              | 0.00                                                                              | 0.10                                                                              | 0.84                                                                                | 0.37                                                                                | 0.04                                                                                | 0.67                                                                                | 0.44                                                                                | 0.02                                                                                |
| Avail Cap(c_a), veh/h        | 254                                                                               | 0                                                                                 | 244                                                                               | 204                                                                               | 0                                                                                 | 282                                                                               | 183                                                                                 | 2809                                                                                | 1257                                                                                | 183                                                                                 | 2622                                                                                | 1173                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.83                                                                                | 0.83                                                                                | 0.83                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 67.9                                                                              | 0.0                                                                               | 64.5                                                                              | 72.8                                                                              | 0.0                                                                               | 65.1                                                                              | 70.8                                                                                | 4.7                                                                                 | 3.4                                                                                 | 75.3                                                                                | 7.7                                                                                 | 5.3                                                                                 |
| Incr Delay (d2), s/veh       | 1.2                                                                               | 0.0                                                                               | 0.0                                                                               | 2.2                                                                               | 0.0                                                                               | 0.3                                                                               | 13.7                                                                                | 0.3                                                                                 | 0.0                                                                                 | 7.4                                                                                 | 0.5                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 2.2                                                                               | 0.0                                                                               | 0.0                                                                               | 1.8                                                                               | 0.0                                                                               | 0.6                                                                               | 5.2                                                                                 | 6.7                                                                                 | 0.4                                                                                 | 1.2                                                                                 | 9.6                                                                                 | 0.3                                                                                 |
| LnGrp Delay(d),s/veh         | 69.2                                                                              | 0.0                                                                               | 64.5                                                                              | 75.0                                                                              | 0.0                                                                               | 65.3                                                                              | 84.5                                                                                | 5.0                                                                                 | 3.4                                                                                 | 82.7                                                                                | 8.2                                                                                 | 5.3                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                 |                                                                                   | E                                                                                 | F                                                                                   | A                                                                                   | A                                                                                   | F                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 54                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 58                                                                                | 1206                                                                                |                                                                                     |                                                                                     | 1207                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 69.1                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 72.3                                                                              | 12.3                                                                                |                                                                                     |                                                                                     | 9.8                                                                                 |                                                                                     |                                                                                     |
| Approach LOS                 | E                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   | E                                                                                 | B                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 4                                                                                 |                                                                                   | 5                                                                                 | 6                                                                                 | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 15.5                                                                              | 120.9                                                                             | 18.6                                                                              |                                                                                   | 7.4                                                                               | 129.0                                                                             | 18.6                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 6.0                                                                               | 5.0                                                                               |                                                                                   | 4.0                                                                               | 6.0                                                                               | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 16.0                                                                              | 100.0                                                                             | 24.0                                                                              |                                                                                   | 16.0                                                                              | 100.0                                                                             | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 11.6                                                                              | 21.4                                                                              | 13.1                                                                              |                                                                                   | 4.3                                                                               | 15.5                                                                              | 8.6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.1                                                                               | 19.3                                                                              | 0.1                                                                               |                                                                                   | 0.0                                                                               | 16.9                                                                              | 0.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 13.7                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 7: Honoapiilani Highway & Kaanapali Parkway/Halelo Street

08/09/2017

|                              |  |  |                                                                                    |  |                                                                                    |  |                                                                                       |                                                                                      |  |  |                                                                                      |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                                                                                                                 | WBL                                                                               | WBT                                                                                                                                                                 | WBR                                                                               | NBL                                                                                                                                                                     | NBT                                                                                                                                                                     | NBR                                                                                 | SBL                                                                                 | SBT                                                                                                                                                                     | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |   |                                                                                   |   |                                                                                   |   |   |                                                                                     |  |   |  |
| Traffic Volume (veh/h)       | 115                                                                               | 6                                                                                 | 214                                                                                                                                                                 | 10                                                                                | 10                                                                                                                                                                  | 8                                                                                 | 410                                                                                                                                                                     | 1071                                                                                                                                                                    | 14                                                                                  | 40                                                                                  | 996                                                                                                                                                                     | 87                                                                                  |
| Future Volume (veh/h)        | 115                                                                               | 6                                                                                 | 214                                                                                                                                                                 | 10                                                                                | 10                                                                                                                                                                  | 8                                                                                 | 410                                                                                                                                                                     | 1071                                                                                                                                                                    | 14                                                                                  | 40                                                                                  | 996                                                                                                                                                                     | 87                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                                                                                                  | 7                                                                                 | 4                                                                                                                                                                   | 14                                                                                | 1                                                                                                                                                                       | 6                                                                                                                                                                       | 16                                                                                  | 5                                                                                   | 2                                                                                                                                                                       | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                                                                                                   | 0                                                                                 | 0                                                                                                                                                                   | 0                                                                                 | 0                                                                                                                                                                       | 0                                                                                                                                                                       | 0                                                                                   | 0                                                                                   | 0                                                                                                                                                                       | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 0.98                                                                                                                                                                | 1.00                                                                              |                                                                                                                                                                     | 0.98                                                                              | 1.00                                                                                                                                                                    |                                                                                                                                                                         | 1.00                                                                                | 1.00                                                                                |                                                                                                                                                                         | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                                                                                                | 1.00                                                                              | 1.00                                                                                                                                                                | 1.00                                                                              | 1.00                                                                                                                                                                    | 1.00                                                                                                                                                                    | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                                                                                                    | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                                                                                                                | 1900                                                                              | 1863                                                                                                                                                                | 1900                                                                              | 1863                                                                                                                                                                    | 1863                                                                                                                                                                    | 1900                                                                                | 1863                                                                                | 1863                                                                                                                                                                    | 1863                                                                                |
| Adj Flow Rate, veh/h         | 125                                                                               | 7                                                                                 | 84                                                                                                                                                                  | 11                                                                                | 11                                                                                                                                                                  | 4                                                                                 | 446                                                                                                                                                                     | 1164                                                                                                                                                                    | 15                                                                                  | 43                                                                                  | 1083                                                                                                                                                                    | 49                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 2                                                                                                                                                                   | 0                                                                                 | 1                                                                                                                                                                   | 0                                                                                 | 2                                                                                                                                                                       | 2                                                                                                                                                                       | 0                                                                                   | 1                                                                                   | 2                                                                                                                                                                       | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                                                                                                | 0.92                                                                              | 0.92                                                                                                                                                                | 0.92                                                                              | 0.92                                                                                                                                                                    | 0.92                                                                                                                                                                    | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                                                                                                    | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                                                                                                   | 2                                                                                 | 2                                                                                                                                                                   | 2                                                                                 | 2                                                                                                                                                                       | 2                                                                                                                                                                       | 2                                                                                   | 2                                                                                   | 2                                                                                                                                                                       | 2                                                                                   |
| Cap, veh/h                   | 220                                                                               | 12                                                                                | 827                                                                                                                                                                 | 67                                                                                | 67                                                                                                                                                                  | 24                                                                                | 618                                                                                                                                                                     | 1885                                                                                                                                                                    | 24                                                                                  | 137                                                                                 | 1501                                                                                                                                                                    | 669                                                                                 |
| Arrive On Green              | 0.13                                                                              | 0.13                                                                              | 0.12                                                                                                                                                                | 0.09                                                                              | 0.09                                                                                                                                                                | 0.06                                                                              | 0.18                                                                                                                                                                    | 0.53                                                                                                                                                                    | 0.50                                                                                | 0.08                                                                                | 0.42                                                                                                                                                                    | 0.42                                                                                |
| Sat Flow, veh/h              | 1684                                                                              | 94                                                                                | 2728                                                                                                                                                                | 749                                                                               | 749                                                                                                                                                                 | 272                                                                               | 3442                                                                                                                                                                    | 3578                                                                                                                                                                    | 46                                                                                  | 1774                                                                                | 3539                                                                                                                                                                    | 1577                                                                                |
| Grp Volume(v), veh/h         | 132                                                                               | 0                                                                                 | 84                                                                                                                                                                  | 26                                                                                | 0                                                                                                                                                                   | 0                                                                                 | 446                                                                                                                                                                     | 576                                                                                                                                                                     | 603                                                                                 | 43                                                                                  | 1083                                                                                                                                                                    | 49                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1779                                                                              | 0                                                                                 | 1364                                                                                                                                                                | 1771                                                                              | 0                                                                                                                                                                   | 0                                                                                 | 1721                                                                                                                                                                    | 1770                                                                                                                                                                    | 1855                                                                                | 1774                                                                                | 1770                                                                                                                                                                    | 1577                                                                                |
| Q Serve(g_s), s              | 6.3                                                                               | 0.0                                                                               | 2.0                                                                                                                                                                 | 1.2                                                                               | 0.0                                                                                                                                                                 | 0.0                                                                               | 11.1                                                                                                                                                                    | 20.8                                                                                                                                                                    | 20.8                                                                                | 2.1                                                                                 | 23.1                                                                                                                                                                    | 1.7                                                                                 |
| Cycle Q Clear(g_c), s        | 6.3                                                                               | 0.0                                                                               | 2.0                                                                                                                                                                 | 1.2                                                                               | 0.0                                                                                                                                                                 | 0.0                                                                               | 11.1                                                                                                                                                                    | 20.8                                                                                                                                                                    | 20.8                                                                                | 2.1                                                                                 | 23.1                                                                                                                                                                    | 1.7                                                                                 |
| Prop In Lane                 | 0.95                                                                              |                                                                                   | 1.00                                                                                                                                                                | 0.42                                                                              |                                                                                                                                                                     | 0.15                                                                              | 1.00                                                                                                                                                                    |                                                                                                                                                                         | 0.02                                                                                | 1.00                                                                                |                                                                                                                                                                         | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 232                                                                               | 0                                                                                 | 827                                                                                                                                                                 | 159                                                                               | 0                                                                                                                                                                   | 0                                                                                 | 618                                                                                                                                                                     | 932                                                                                                                                                                     | 977                                                                                 | 137                                                                                 | 1501                                                                                                                                                                    | 669                                                                                 |
| V/C Ratio(X)                 | 0.57                                                                              | 0.00                                                                              | 0.10                                                                                                                                                                | 0.16                                                                              | 0.00                                                                                                                                                                | 0.00                                                                              | 0.72                                                                                                                                                                    | 0.62                                                                                                                                                                    | 0.62                                                                                | 0.31                                                                                | 0.72                                                                                                                                                                    | 0.07                                                                                |
| Avail Cap(c_a), veh/h        | 1095                                                                              | 0                                                                                 | 2150                                                                                                                                                                | 681                                                                               | 0                                                                                                                                                                   | 0                                                                                 | 1627                                                                                                                                                                    | 4066                                                                                                                                                                    | 4261                                                                                | 410                                                                                 | 7276                                                                                                                                                                    | 3241                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                                                                                                | 1.00                                                                              | 1.00                                                                                                                                                                | 1.00                                                                              | 1.00                                                                                                                                                                    | 1.00                                                                                                                                                                    | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                                                                                                    | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                                                                                                                | 1.00                                                                              | 0.00                                                                                                                                                                | 0.00                                                                              | 1.00                                                                                                                                                                    | 1.00                                                                                                                                                                    | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                                                                                                    | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 37.1                                                                              | 0.0                                                                               | 23.0                                                                                                                                                                | 38.5                                                                              | 0.0                                                                                                                                                                 | 0.0                                                                               | 35.2                                                                                                                                                                    | 15.1                                                                                                                                                                    | 15.1                                                                                | 39.7                                                                                | 21.7                                                                                                                                                                    | 15.6                                                                                |
| Incr Delay (d2), s/veh       | 0.8                                                                               | 0.0                                                                               | 0.0                                                                                                                                                                 | 0.5                                                                               | 0.0                                                                                                                                                                 | 0.0                                                                               | 0.6                                                                                                                                                                     | 1.0                                                                                                                                                                     | 0.9                                                                                 | 0.5                                                                                 | 0.9                                                                                                                                                                     | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                                                                                                 | 0.0                                                                               | 0.0                                                                                                                                                                 | 0.0                                                                               | 0.0                                                                                                                                                                     | 0.0                                                                                                                                                                     | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                                                                                                     | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 3.2                                                                               | 0.0                                                                               | 0.8                                                                                                                                                                 | 0.6                                                                               | 0.0                                                                                                                                                                 | 0.0                                                                               | 5.3                                                                                                                                                                     | 10.3                                                                                                                                                                    | 10.8                                                                                | 1.0                                                                                 | 11.5                                                                                                                                                                    | 0.7                                                                                 |
| LnGrp Delay(d),s/veh         | 37.9                                                                              | 0.0                                                                               | 23.1                                                                                                                                                                | 38.9                                                                              | 0.0                                                                                                                                                                 | 0.0                                                                               | 35.8                                                                                                                                                                    | 16.1                                                                                                                                                                    | 16.0                                                                                | 40.2                                                                                | 22.7                                                                                                                                                                    | 15.6                                                                                |
| LnGrp LOS                    | D                                                                                 |                                                                                   | C                                                                                                                                                                   | D                                                                                 |                                                                                                                                                                     |                                                                                   | D                                                                                                                                                                       | B                                                                                                                                                                       | B                                                                                   | D                                                                                   | C                                                                                                                                                                       | B                                                                                   |
| Approach Vol, veh/h          | 216                                                                               |                                                                                   | 26                                                                                                                                                                  |                                                                                   |                                                                                                                                                                     |                                                                                   | 1625                                                                                                                                                                    |                                                                                                                                                                         |                                                                                     |                                                                                     | 1175                                                                                                                                                                    |                                                                                     |
| Approach Delay, s/veh        | 32.2                                                                              |                                                                                   | 38.9                                                                                                                                                                |                                                                                   |                                                                                                                                                                     |                                                                                   | 21.5                                                                                                                                                                    |                                                                                                                                                                         |                                                                                     |                                                                                     | 23.0                                                                                                                                                                    |                                                                                     |
| Approach LOS                 | C                                                                                 |                                                                                   | D                                                                                                                                                                   |                                                                                   |                                                                                                                                                                     |                                                                                   | C                                                                                                                                                                       |                                                                                                                                                                         |                                                                                     |                                                                                     | C                                                                                                                                                                       |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                                                                                                   | 4                                                                                 | 5                                                                                                                                                                   | 6                                                                                 | 7                                                                                                                                                                       | 8                                                                                                                                                                       |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 4                                                                                                                                                                   |                                                                                   | 5                                                                                                                                                                   | 6                                                                                 | 8                                                                                                                                                                       |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 20.3                                                                              | 42.6                                                                              | 12.2                                                                                                                                                                |                                                                                   | 11.0                                                                                                                                                                | 51.9                                                                              | 15.9                                                                                                                                                                    |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Change Period (Y+Rc), s      | 6.0                                                                               | 6.0                                                                               | 7.0                                                                                                                                                                 |                                                                                   | 6.0                                                                                                                                                                 | 6.0                                                                               | 7.0                                                                                                                                                                     |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Max Green Setting (Gmax), s  | 41.0                                                                              | 185.0                                                                             | 32.0                                                                                                                                                                |                                                                                   | 19.0                                                                                                                                                                | 207.0                                                                             | 53.0                                                                                                                                                                    |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 13.1                                                                              | 25.1                                                                              | 3.2                                                                                                                                                                 |                                                                                   | 4.1                                                                                                                                                                 | 22.8                                                                              | 8.3                                                                                                                                                                     |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Green Ext Time (p_c), s      | 1.2                                                                               | 11.5                                                                              | 0.1                                                                                                                                                                 |                                                                                   | 0.0                                                                                                                                                                 | 11.0                                                                              | 0.6                                                                                                                                                                     |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                                                                                                     |                                                                                   |                                                                                                                                                                     |                                                                                   |                                                                                                                                                                         |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 23.0                                                                                                                                                                |                                                                                   |                                                                                                                                                                     |                                                                                   |                                                                                                                                                                         |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | C                                                                                                                                                                   |                                                                                   |                                                                                                                                                                     |                                                                                   |                                                                                                                                                                         |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 8: Honoapiilani Highway & Leialii Parkway

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |                                                                                     |
| Traffic Volume (veh/h)       | 2                                                                                 | 1                                                                                 | 4                                                                                 | 56                                                                                | 0                                                                                 | 39                                                                                | 3                                                                                   | 1485                                                                                | 86                                                                                  | 25                                                                                  | 1190                                                                                | 4                                                                                   |
| Future Volume (veh/h)        | 2                                                                                 | 1                                                                                 | 4                                                                                 | 56                                                                                | 0                                                                                 | 39                                                                                | 3                                                                                   | 1485                                                                                | 86                                                                                  | 25                                                                                  | 1190                                                                                | 4                                                                                   |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                              |                                                                                   | 0.97                                                                              | 0.98                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 2                                                                                 | 1                                                                                 | 1                                                                                 | 61                                                                                | 0                                                                                 | 1                                                                                 | 3                                                                                   | 1614                                                                                | 91                                                                                  | 27                                                                                  | 1293                                                                                | 4                                                                                   |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 94                                                                                | 46                                                                                | 34                                                                                | 172                                                                               | 0                                                                                 | 134                                                                               | 7                                                                                   | 2697                                                                                | 151                                                                                 | 63                                                                                  | 2980                                                                                | 9                                                                                   |
| Arrive On Green              | 0.09                                                                              | 0.09                                                                              | 0.08                                                                              | 0.09                                                                              | 0.00                                                                              | 0.08                                                                              | 0.00                                                                                | 0.79                                                                                | 0.78                                                                                | 0.04                                                                                | 0.82                                                                                | 0.82                                                                                |
| Sat Flow, veh/h              | 635                                                                               | 533                                                                               | 389                                                                               | 1376                                                                              | 0                                                                                 | 1542                                                                              | 1774                                                                                | 3407                                                                                | 191                                                                                 | 1774                                                                                | 3619                                                                                | 11                                                                                  |
| Grp Volume(v), veh/h         | 4                                                                                 | 0                                                                                 | 0                                                                                 | 61                                                                                | 0                                                                                 | 1                                                                                 | 3                                                                                   | 834                                                                                 | 871                                                                                 | 27                                                                                  | 632                                                                                 | 665                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1557                                                                              | 0                                                                                 | 0                                                                                 | 1376                                                                              | 0                                                                                 | 1542                                                                              | 1774                                                                                | 1770                                                                                | 1828                                                                                | 1774                                                                                | 1770                                                                                | 1861                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 5.6                                                                               | 0.0                                                                               | 0.1                                                                               | 0.2                                                                                 | 26.0                                                                                | 26.6                                                                                | 2.1                                                                                 | 13.7                                                                                | 13.7                                                                                |
| Cycle Q Clear(g_c), s        | 0.3                                                                               | 0.0                                                                               | 0.0                                                                               | 5.9                                                                               | 0.0                                                                               | 0.1                                                                               | 0.2                                                                                 | 26.0                                                                                | 26.6                                                                                | 2.1                                                                                 | 13.7                                                                                | 13.7                                                                                |
| Prop In Lane                 | 0.50                                                                              |                                                                                   | 0.25                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 0.10                                                                                | 1.00                                                                                |                                                                                     | 0.01                                                                                |
| Lane Grp Cap(c), veh/h       | 174                                                                               | 0                                                                                 | 0                                                                                 | 172                                                                               | 0                                                                                 | 134                                                                               | 7                                                                                   | 1401                                                                                | 1448                                                                                | 63                                                                                  | 1457                                                                                | 1532                                                                                |
| V/C Ratio(X)                 | 0.02                                                                              | 0.00                                                                              | 0.00                                                                              | 0.36                                                                              | 0.00                                                                              | 0.01                                                                              | 0.43                                                                                | 0.60                                                                                | 0.60                                                                                | 0.43                                                                                | 0.43                                                                                | 0.43                                                                                |
| Avail Cap(c_a), veh/h        | 302                                                                               | 0                                                                                 | 0                                                                                 | 288                                                                               | 0                                                                                 | 264                                                                               | 101                                                                                 | 1401                                                                                | 1448                                                                                | 101                                                                                 | 1457                                                                                | 1532                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.77                                                                                | 0.77                                                                                | 0.77                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 58.6                                                                              | 0.0                                                                               | 0.0                                                                               | 61.0                                                                              | 0.0                                                                               | 58.9                                                                              | 69.6                                                                                | 5.7                                                                                 | 5.8                                                                                 | 66.1                                                                                | 3.4                                                                                 | 3.4                                                                                 |
| Incr Delay (d2), s/veh       | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 1.2                                                                               | 0.0                                                                               | 0.0                                                                               | 11.5                                                                                | 1.4                                                                                 | 1.4                                                                                 | 1.7                                                                                 | 0.9                                                                                 | 0.9                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 2.3                                                                               | 0.0                                                                               | 0.0                                                                               | 0.1                                                                                 | 13.1                                                                                | 13.7                                                                                | 1.1                                                                                 | 7.1                                                                                 | 7.4                                                                                 |
| LnGrp Delay(d),s/veh         | 58.7                                                                              | 0.0                                                                               | 0.0                                                                               | 62.2                                                                              | 0.0                                                                               | 58.9                                                                              | 81.1                                                                                | 7.2                                                                                 | 7.3                                                                                 | 67.8                                                                                | 4.3                                                                                 | 4.3                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   | E                                                                                 | F                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 4                                                                                 |                                                                                   |                                                                                   | 62                                                                                |                                                                                   |                                                                                     | 1708                                                                                |                                                                                     |                                                                                     | 1324                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 58.7                                                                              |                                                                                   |                                                                                   | 62.2                                                                              |                                                                                   |                                                                                     | 7.4                                                                                 |                                                                                     |                                                                                     | 5.6                                                                                 |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 4.6                                                                               | 119.3                                                                             |                                                                                   | 16.2                                                                              | 9.0                                                                               | 114.8                                                                             |                                                                                     | 16.2                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 8.0                                                                               | 95.0                                                                              |                                                                                   | 23.0                                                                              | 8.0                                                                               | 95.0                                                                              |                                                                                     | 23.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.2                                                                               | 15.7                                                                              |                                                                                   | 7.9                                                                               | 4.1                                                                               | 28.6                                                                              |                                                                                     | 2.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 21.4                                                                              |                                                                                   | 0.1                                                                               | 0.0                                                                               | 35.5                                                                              |                                                                                     | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   |                                                                                   | 7.8                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 9: Honoapiilani Highway & Front Street/Flemming Road

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |                                                                                   |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 81                                                                                | 4                                                                                 | 3                                                                                 | 101                                                                               | 15                                                                                | 13                                                                                | 2                                                                                   | 1471                                                                                | 16                                                                                  | 6                                                                                   | 1059                                                                                | 167                                                                                 |
| Future Volume (veh/h)        | 81                                                                                | 4                                                                                 | 3                                                                                 | 101                                                                               | 15                                                                                | 13                                                                                | 2                                                                                   | 1471                                                                                | 16                                                                                  | 6                                                                                   | 1059                                                                                | 167                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 88                                                                                | 4                                                                                 | 2                                                                                 | 110                                                                               | 16                                                                                | 11                                                                                | 2                                                                                   | 1599                                                                                | 17                                                                                  | 7                                                                                   | 1151                                                                                | 130                                                                                 |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 0                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 207                                                                               | 9                                                                                 | 3                                                                                 | 194                                                                               | 20                                                                                | 14                                                                                | 3                                                                                   | 2825                                                                                | 30                                                                                  | 9                                                                                   | 2800                                                                                | 1251                                                                                |
| Arrive On Green              | 0.11                                                                              | 0.11                                                                              | 0.10                                                                              | 0.11                                                                              | 0.11                                                                              | 0.10                                                                              | 0.00                                                                                | 0.79                                                                                | 0.78                                                                                | 0.01                                                                                | 0.79                                                                                | 0.79                                                                                |
| Sat Flow, veh/h              | 1388                                                                              | 82                                                                                | 32                                                                                | 1308                                                                              | 190                                                                               | 131                                                                               | 1774                                                                                | 3588                                                                                | 38                                                                                  | 1774                                                                                | 3539                                                                                | 1581                                                                                |
| Grp Volume(v), veh/h         | 94                                                                                | 0                                                                                 | 0                                                                                 | 137                                                                               | 0                                                                                 | 0                                                                                 | 2                                                                                   | 788                                                                                 | 828                                                                                 | 7                                                                                   | 1151                                                                                | 130                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1503                                                                              | 0                                                                                 | 0                                                                                 | 1629                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1856                                                                                | 1774                                                                                | 1770                                                                                | 1581                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 2.5                                                                               | 0.0                                                                               | 0.0                                                                               | 0.1                                                                                 | 20.5                                                                                | 20.5                                                                                | 0.5                                                                                 | 12.1                                                                                | 2.2                                                                                 |
| Cycle Q Clear(g_c), s        | 7.0                                                                               | 0.0                                                                               | 0.0                                                                               | 9.5                                                                               | 0.0                                                                               | 0.0                                                                               | 0.1                                                                                 | 20.5                                                                                | 20.5                                                                                | 0.5                                                                                 | 12.1                                                                                | 2.2                                                                                 |
| Prop In Lane                 | 0.94                                                                              |                                                                                   | 0.02                                                                              | 0.80                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                                |                                                                                     | 0.02                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 219                                                                               | 0                                                                                 | 0                                                                                 | 229                                                                               | 0                                                                                 | 0                                                                                 | 3                                                                                   | 1394                                                                                | 1462                                                                                | 9                                                                                   | 2800                                                                                | 1251                                                                                |
| V/C Ratio(X)                 | 0.43                                                                              | 0.00                                                                              | 0.00                                                                              | 0.60                                                                              | 0.00                                                                              | 0.00                                                                              | 0.70                                                                                | 0.57                                                                                | 0.57                                                                                | 0.76                                                                                | 0.41                                                                                | 0.10                                                                                |
| Avail Cap(c_a), veh/h        | 430                                                                               | 0                                                                                 | 0                                                                                 | 449                                                                               | 0                                                                                 | 0                                                                                 | 118                                                                                 | 1394                                                                                | 1462                                                                                | 118                                                                                 | 2800                                                                                | 1251                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.78                                                                                | 0.78                                                                                | 0.78                                                                                | 0.91                                                                                | 0.91                                                                                | 0.91                                                                                |
| Uniform Delay (d), s/veh     | 50.9                                                                              | 0.0                                                                               | 0.0                                                                               | 51.9                                                                              | 0.0                                                                               | 0.0                                                                               | 59.9                                                                                | 4.9                                                                                 | 4.9                                                                                 | 59.6                                                                                | 3.9                                                                                 | 2.9                                                                                 |
| Incr Delay (d2), s/veh       | 1.3                                                                               | 0.0                                                                               | 0.0                                                                               | 2.5                                                                               | 0.0                                                                               | 0.0                                                                               | 62.7                                                                                | 1.3                                                                                 | 1.2                                                                                 | 33.9                                                                                | 0.4                                                                                 | 0.2                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 3.1                                                                               | 0.0                                                                               | 0.0                                                                               | 4.6                                                                               | 0.0                                                                               | 0.0                                                                               | 0.1                                                                                 | 10.4                                                                                | 10.9                                                                                | 0.3                                                                                 | 5.9                                                                                 | 1.0                                                                                 |
| LnGrp Delay(d),s/veh         | 52.2                                                                              | 0.0                                                                               | 0.0                                                                               | 54.4                                                                              | 0.0                                                                               | 0.0                                                                               | 122.6                                                                               | 6.2                                                                                 | 6.1                                                                                 | 93.5                                                                                | 4.3                                                                                 | 3.0                                                                                 |
| LnGrp LOS                    | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | F                                                                                   | A                                                                                   | A                                                                                   | F                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 94                                                                                |                                                                                   |                                                                                   |                                                                                   | 137                                                                               |                                                                                   |                                                                                     |                                                                                     | 1618                                                                                |                                                                                     | 1288                                                                                |                                                                                     |
| Approach Delay, s/veh        | 52.2                                                                              |                                                                                   |                                                                                   |                                                                                   | 54.4                                                                              |                                                                                   |                                                                                     |                                                                                     | 6.3                                                                                 |                                                                                     | 4.6                                                                                 |                                                                                     |
| Approach LOS                 | D                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     | A                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 4                                                                                 |                                                                                   | 5                                                                                 | 6                                                                                 | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 4.2                                                                               | 98.9                                                                              | 16.9                                                                              |                                                                                   | 4.6                                                                               | 98.5                                                                              | 16.9                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   | 4.0                                                                               | 5.0                                                                               | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 8.0                                                                               | 68.0                                                                              | 30.0                                                                              |                                                                                   | 8.0                                                                               | 68.0                                                                              | 30.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.1                                                                               | 14.1                                                                              | 11.5                                                                              |                                                                                   | 2.5                                                                               | 22.5                                                                              | 9.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 26.7                                                                              | 0.4                                                                               |                                                                                   | 0.0                                                                               | 33.0                                                                              | 0.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 9.1                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 10: Honoapiilani Highway & Kapunakea Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 95                                                                                | 27                                                                                | 19                                                                                | 141                                                                               | 23                                                                                | 29                                                                                | 23                                                                                 | 1353                                                                                | 71                                                                                  | 7                                                                                   | 1103                                                                                | 62                                                                                  |
| Future Volume (veh/h)        | 95                                                                                | 27                                                                                | 19                                                                                | 141                                                                               | 23                                                                                | 29                                                                                | 23                                                                                 | 1353                                                                                | 71                                                                                  | 7                                                                                   | 1103                                                                                | 62                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                              |                                                                                   | 0.98                                                                              | 0.99                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 103                                                                               | 29                                                                                | 3                                                                                 | 153                                                                               | 25                                                                                | 4                                                                                 | 25                                                                                 | 1471                                                                                | 75                                                                                  | 8                                                                                   | 1199                                                                                | 65                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 194                                                                               | 42                                                                                | 227                                                                               | 259                                                                               | 229                                                                               | 37                                                                                | 31                                                                                 | 2612                                                                                | 133                                                                                 | 10                                                                                  | 2562                                                                                | 139                                                                                 |
| Arrive On Green              | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.14                                                                              | 0.04                                                                               | 1.00                                                                                | 1.00                                                                                | 0.01                                                                                | 0.75                                                                                | 0.74                                                                                |
| Sat Flow, veh/h              | 1016                                                                              | 286                                                                               | 1554                                                                              | 1359                                                                              | 1563                                                                              | 250                                                                               | 1774                                                                               | 3427                                                                                | 174                                                                                 | 1774                                                                                | 3415                                                                                | 185                                                                                 |
| Grp Volume(v), veh/h         | 132                                                                               | 0                                                                                 | 3                                                                                 | 153                                                                               | 0                                                                                 | 29                                                                                | 25                                                                                 | 757                                                                                 | 789                                                                                 | 8                                                                                   | 621                                                                                 | 643                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1302                                                                              | 0                                                                                 | 1554                                                                              | 1359                                                                              | 0                                                                                 | 1813                                                                              | 1774                                                                               | 1770                                                                                | 1832                                                                                | 1774                                                                                | 1770                                                                                | 1830                                                                                |
| Q Serve(g_s), s              | 12.3                                                                              | 0.0                                                                               | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 1.9                                                                               | 2.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.6                                                                                 | 18.9                                                                                | 19.0                                                                                |
| Cycle Q Clear(g_c), s        | 14.2                                                                              | 0.0                                                                               | 0.2                                                                               | 14.2                                                                              | 0.0                                                                               | 1.9                                                                               | 2.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.6                                                                                 | 18.9                                                                                | 19.0                                                                                |
| Prop In Lane                 | 0.78                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.14                                                                              | 1.00                                                                               |                                                                                     | 0.10                                                                                | 1.00                                                                                |                                                                                     | 0.10                                                                                |
| Lane Grp Cap(c), veh/h       | 236                                                                               | 0                                                                                 | 227                                                                               | 259                                                                               | 0                                                                                 | 265                                                                               | 31                                                                                 | 1349                                                                                | 1396                                                                                | 10                                                                                  | 1328                                                                                | 1373                                                                                |
| V/C Ratio(X)                 | 0.56                                                                              | 0.00                                                                              | 0.01                                                                              | 0.59                                                                              | 0.00                                                                              | 0.11                                                                              | 0.80                                                                               | 0.56                                                                                | 0.56                                                                                | 0.79                                                                                | 0.47                                                                                | 0.47                                                                                |
| Avail Cap(c_a), veh/h        | 314                                                                               | 0                                                                                 | 311                                                                               | 332                                                                               | 0                                                                                 | 363                                                                               | 139                                                                                | 1349                                                                                | 1396                                                                                | 139                                                                                 | 1328                                                                                | 1373                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 2.00                                                                               | 2.00                                                                                | 2.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.73                                                                               | 0.73                                                                                | 0.73                                                                                | 0.91                                                                                | 0.91                                                                                | 0.91                                                                                |
| Uniform Delay (d), s/veh     | 58.0                                                                              | 0.0                                                                               | 51.1                                                                              | 57.1                                                                              | 0.0                                                                               | 51.9                                                                              | 67.3                                                                               | 0.0                                                                                 | 0.0                                                                                 | 69.5                                                                                | 6.7                                                                                 | 6.8                                                                                 |
| Incr Delay (d2), s/veh       | 2.1                                                                               | 0.0                                                                               | 0.0                                                                               | 2.2                                                                               | 0.0                                                                               | 0.2                                                                               | 12.0                                                                               | 1.2                                                                                 | 1.2                                                                                 | 35.0                                                                                | 1.1                                                                                 | 1.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 5.0                                                                               | 0.0                                                                               | 0.1                                                                               | 5.8                                                                               | 0.0                                                                               | 1.0                                                                               | 1.1                                                                                | 0.5                                                                                 | 0.5                                                                                 | 0.4                                                                                 | 9.5                                                                                 | 9.9                                                                                 |
| LnGrp Delay(d),s/veh         | 60.1                                                                              | 0.0                                                                               | 51.1                                                                              | 59.2                                                                              | 0.0                                                                               | 52.1                                                                              | 79.2                                                                               | 1.2                                                                                 | 1.2                                                                                 | 104.5                                                                               | 7.8                                                                                 | 7.8                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | E                                                                                 |                                                                                   | D                                                                                 | E                                                                                  | A                                                                                   | A                                                                                   | F                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 135                                                                               |                                                                                   |                                                                                   | 182                                                                               |                                                                                   |                                                                                    | 1571                                                                                |                                                                                     |                                                                                     | 1272                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 59.9                                                                              |                                                                                   |                                                                                   | 58.1                                                                              |                                                                                   |                                                                                    | 2.5                                                                                 |                                                                                     |                                                                                     | 8.4                                                                                 |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                    | A                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 6.5                                                                               | 109.0                                                                             |                                                                                   | 24.5                                                                              | 4.8                                                                               | 110.7                                                                             |                                                                                    | 24.5                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 11.0                                                                              | 88.0                                                                              |                                                                                   | 27.0                                                                              | 11.0                                                                              | 88.0                                                                              |                                                                                    | 27.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 4.0                                                                               | 21.0                                                                              |                                                                                   | 16.2                                                                              | 2.6                                                                               | 2.0                                                                               |                                                                                    | 16.2                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 19.9                                                                              |                                                                                   | 0.5                                                                               | 0.0                                                                               | 32.0                                                                              |                                                                                    | 0.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 10.5                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 11: Honoapiilani Highway & Keawe Street

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 13                                                                                | 95                                                                                | 45                                                                                | 115                                                                               | 60                                                                                | 430                                                                               | 36                                                                                  | 968                                                                                 | 164                                                                                 | 275                                                                                 | 940                                                                                 | 17                                                                                  |
| Future Volume (veh/h)        | 13                                                                                | 95                                                                                | 45                                                                                | 115                                                                               | 60                                                                                | 430                                                                               | 36                                                                                  | 968                                                                                 | 164                                                                                 | 275                                                                                 | 940                                                                                 | 17                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                              |                                                                                   | 0.98                                                                              | 0.99                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 14                                                                                | 103                                                                               | 2                                                                                 | 125                                                                               | 65                                                                                | 124                                                                               | 39                                                                                  | 1052                                                                                | 114                                                                                 | 299                                                                                 | 1022                                                                                | 17                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 42                                                                                | 180                                                                               | 167                                                                               | 251                                                                               | 402                                                                               | 337                                                                               | 50                                                                                  | 1835                                                                                | 818                                                                                 | 320                                                                                 | 2388                                                                                | 40                                                                                  |
| Arrive On Green              | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.08                                                                              | 0.22                                                                              | 0.22                                                                              | 0.03                                                                                | 0.52                                                                                | 0.52                                                                                | 0.36                                                                                | 1.00                                                                                | 1.00                                                                                |
| Sat Flow, veh/h              | 126                                                                               | 1662                                                                              | 1544                                                                              | 1774                                                                              | 1863                                                                              | 1564                                                                              | 1774                                                                                | 3539                                                                                | 1577                                                                                | 1774                                                                                | 3562                                                                                | 59                                                                                  |
| Grp Volume(v), veh/h         | 117                                                                               | 0                                                                                 | 2                                                                                 | 125                                                                               | 65                                                                                | 124                                                                               | 39                                                                                  | 1052                                                                                | 114                                                                                 | 299                                                                                 | 508                                                                                 | 531                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1788                                                                              | 0                                                                                 | 1544                                                                              | 1774                                                                              | 1863                                                                              | 1564                                                                              | 1774                                                                                | 1770                                                                                | 1577                                                                                | 1774                                                                                | 1770                                                                                | 1852                                                                                |
| Q Serve(g_s), s              | 2.5                                                                               | 0.0                                                                               | 0.2                                                                               | 8.5                                                                               | 4.0                                                                               | 9.5                                                                               | 3.1                                                                                 | 28.5                                                                                | 5.3                                                                                 | 22.8                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Cycle Q Clear(g_c), s        | 8.5                                                                               | 0.0                                                                               | 0.2                                                                               | 8.5                                                                               | 4.0                                                                               | 9.5                                                                               | 3.1                                                                                 | 28.5                                                                                | 5.3                                                                                 | 22.8                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Prop In Lane                 | 0.12                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 0.03                                                                                |
| Lane Grp Cap(c), veh/h       | 223                                                                               | 0                                                                                 | 167                                                                               | 251                                                                               | 402                                                                               | 337                                                                               | 50                                                                                  | 1835                                                                                | 818                                                                                 | 320                                                                                 | 1186                                                                                | 1242                                                                                |
| V/C Ratio(X)                 | 0.53                                                                              | 0.00                                                                              | 0.01                                                                              | 0.50                                                                              | 0.16                                                                              | 0.37                                                                              | 0.78                                                                                | 0.57                                                                                | 0.14                                                                                | 0.94                                                                                | 0.43                                                                                | 0.43                                                                                |
| Avail Cap(c_a), veh/h        | 320                                                                               | 0                                                                                 | 254                                                                               | 251                                                                               | 506                                                                               | 424                                                                               | 177                                                                                 | 1835                                                                                | 818                                                                                 | 431                                                                                 | 1186                                                                                | 1242                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.79                                                                                | 0.79                                                                                | 0.79                                                                                | 0.83                                                                                | 0.83                                                                                | 0.83                                                                                |
| Uniform Delay (d), s/veh     | 59.4                                                                              | 0.0                                                                               | 55.7                                                                              | 48.5                                                                              | 44.6                                                                              | 46.8                                                                              | 67.6                                                                                | 23.1                                                                                | 17.5                                                                                | 44.0                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Incr Delay (d2), s/veh       | 1.9                                                                               | 0.0                                                                               | 0.0                                                                               | 1.5                                                                               | 0.2                                                                               | 0.7                                                                               | 7.3                                                                                 | 1.0                                                                                 | 0.3                                                                                 | 18.2                                                                                | 0.9                                                                                 | 0.9                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 4.4                                                                               | 0.0                                                                               | 0.1                                                                               | 4.2                                                                               | 2.1                                                                               | 4.2                                                                               | 1.6                                                                                 | 14.1                                                                                | 2.3                                                                                 | 12.7                                                                                | 0.3                                                                                 | 0.3                                                                                 |
| LnGrp Delay(d),s/veh         | 61.3                                                                              | 0.0                                                                               | 55.7                                                                              | 50.0                                                                              | 44.8                                                                              | 47.5                                                                              | 74.9                                                                                | 24.1                                                                                | 17.8                                                                                | 62.1                                                                                | 0.9                                                                                 | 0.9                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   | E                                                                                 | D                                                                                 | D                                                                                 | D                                                                                 | E                                                                                   | C                                                                                   | B                                                                                   | E                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 119                                                                               |                                                                                   |                                                                                   | 314                                                                               |                                                                                   |                                                                                     | 1205                                                                                |                                                                                     |                                                                                     | 1338                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 61.2                                                                              |                                                                                   |                                                                                   | 47.9                                                                              |                                                                                   |                                                                                     | 25.2                                                                                |                                                                                     |                                                                                     | 14.6                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                     | C                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 8.0                                                                               | 97.9                                                                              | 15.0                                                                              | 19.2                                                                              | 29.2                                                                              | 76.6                                                                              |                                                                                     | 34.2                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 14.0                                                                              | 75.0                                                                              | 10.0                                                                              | 22.0                                                                              | 34.0                                                                              | 55.0                                                                              |                                                                                     | 37.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 5.1                                                                               | 2.0                                                                               | 10.5                                                                              | 10.5                                                                              | 24.8                                                                              | 30.5                                                                              |                                                                                     | 11.5                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 14.0                                                                              | 0.0                                                                               | 0.3                                                                               | 0.5                                                                               | 12.4                                                                              |                                                                                     | 0.8                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 24.3                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Notes</b>                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



---

## **APPENDIX C**

### LEVEL OF SERVICE CALCULATIONS

- Existing PM Peak
-

# HCM 2010 Signalized Intersection Summary

## 1: Napilihau Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 53                                                                                | 8                                                                                 | 345                                                                               | 36                                                                                | 14                                                                                | 3                                                                                 | 352                                                                                | 194                                                                                 | 22                                                                                  | 2                                                                                   | 252                                                                                 | 72                                                                                  |
| Future Volume (veh/h)        | 53                                                                                | 8                                                                                 | 345                                                                               | 36                                                                                | 14                                                                                | 3                                                                                 | 352                                                                                | 194                                                                                 | 22                                                                                  | 2                                                                                   | 252                                                                                 | 72                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                  | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 58                                                                                | 9                                                                                 | 23                                                                                | 39                                                                                | 15                                                                                | 1                                                                                 | 383                                                                                | 211                                                                                 | 21                                                                                  | 2                                                                                   | 274                                                                                 | 19                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 1                                                                                   | 0                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 295                                                                               | 35                                                                                | 178                                                                               | 221                                                                               | 64                                                                                | 3                                                                                 | 477                                                                                | 874                                                                                 | 87                                                                                  | 4                                                                                   | 479                                                                                 | 407                                                                                 |
| Arrive On Green              | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.27                                                                               | 0.52                                                                                | 0.52                                                                                | 0.00                                                                                | 0.26                                                                                | 0.26                                                                                |
| Sat Flow, veh/h              | 1275                                                                              | 313                                                                               | 1583                                                                              | 731                                                                               | 567                                                                               | 24                                                                                | 1774                                                                               | 1667                                                                                | 166                                                                                 | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 67                                                                                | 0                                                                                 | 23                                                                                | 55                                                                                | 0                                                                                 | 0                                                                                 | 383                                                                                | 0                                                                                   | 232                                                                                 | 2                                                                                   | 274                                                                                 | 19                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1588                                                                              | 0                                                                                 | 1583                                                                              | 1322                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                               | 0                                                                                   | 1833                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.6                                                                               | 0.6                                                                               | 0.0                                                                               | 0.0                                                                               | 8.9                                                                                | 0.0                                                                                 | 3.1                                                                                 | 0.0                                                                                 | 5.7                                                                                 | 0.4                                                                                 |
| Cycle Q Clear(g_c), s        | 1.5                                                                               | 0.0                                                                               | 0.6                                                                               | 2.1                                                                               | 0.0                                                                               | 0.0                                                                               | 8.9                                                                                | 0.0                                                                                 | 3.1                                                                                 | 0.0                                                                                 | 5.7                                                                                 | 0.4                                                                                 |
| Prop In Lane                 | 0.87                                                                              |                                                                                   | 1.00                                                                              | 0.71                                                                              |                                                                                   | 0.02                                                                              | 1.00                                                                               |                                                                                     | 0.09                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 331                                                                               | 0                                                                                 | 178                                                                               | 288                                                                               | 0                                                                                 | 0                                                                                 | 477                                                                                | 0                                                                                   | 961                                                                                 | 4                                                                                   | 479                                                                                 | 407                                                                                 |
| V/C Ratio(X)                 | 0.20                                                                              | 0.00                                                                              | 0.13                                                                              | 0.19                                                                              | 0.00                                                                              | 0.00                                                                              | 0.80                                                                               | 0.00                                                                                | 0.24                                                                                | 0.50                                                                                | 0.57                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h        | 949                                                                               | 0                                                                                 | 858                                                                               | 924                                                                               | 0                                                                                 | 0                                                                                 | 1202                                                                               | 0                                                                                   | 3271                                                                                | 601                                                                                 | 2692                                                                                | 2288                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                               | 0.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 18.1                                                                              | 0.0                                                                               | 17.7                                                                              | 18.2                                                                              | 0.0                                                                               | 0.0                                                                               | 15.1                                                                               | 0.0                                                                                 | 5.7                                                                                 | 22.1                                                                                | 14.3                                                                                | 12.4                                                                                |
| Incr Delay (d2), s/veh       | 0.3                                                                               | 0.0                                                                               | 0.3                                                                               | 0.3                                                                               | 0.0                                                                               | 0.0                                                                               | 3.2                                                                                | 0.0                                                                                 | 0.3                                                                                 | 73.1                                                                                | 2.3                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.8                                                                               | 0.0                                                                               | 0.3                                                                               | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 4.8                                                                                | 0.0                                                                                 | 1.6                                                                                 | 0.1                                                                                 | 3.2                                                                                 | 0.2                                                                                 |
| LnGrp Delay(d),s/veh         | 18.4                                                                              | 0.0                                                                               | 18.0                                                                              | 18.5                                                                              | 0.0                                                                               | 0.0                                                                               | 18.3                                                                               | 0.0                                                                                 | 6.0                                                                                 | 95.1                                                                                | 16.6                                                                                | 12.5                                                                                |
| LnGrp LOS                    | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                 |                                                                                   |                                                                                   | B                                                                                  |                                                                                     | A                                                                                   | F                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 90                                                                                |                                                                                   |                                                                                   | 55                                                                                |                                                                                   |                                                                                    | 615                                                                                 |                                                                                     |                                                                                     | 295                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 18.3                                                                              |                                                                                   |                                                                                   | 18.5                                                                              |                                                                                   |                                                                                    | 13.7                                                                                |                                                                                     |                                                                                     | 16.9                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.1                                                                               | 29.2                                                                              |                                                                                   | 10.0                                                                              | 16.9                                                                              | 17.4                                                                              |                                                                                    | 10.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 79.0                                                                              |                                                                                   | 24.0                                                                              | 30.0                                                                              | 64.0                                                                              |                                                                                    | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.0                                                                               | 5.1                                                                               |                                                                                   | 3.5                                                                               | 10.9                                                                              | 7.7                                                                               |                                                                                    | 4.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 3.0                                                                               |                                                                                   | 0.3                                                                               | 1.1                                                                               | 3.7                                                                               |                                                                                    | 0.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 15.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## HCM 2010 Signalized Intersection Summary 2: Hoohui Road

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 68                                                                                | 18                                                                                | 135                                                                               | 41                                                                                | 14                                                                                | 7                                                                                 | 179                                                                                 | 493                                                                                 | 40                                                                                  | 21                                                                                  | 496                                                                                 | 75                                                                                  |
| Future Volume (veh/h)        | 68                                                                                | 18                                                                                | 135                                                                               | 41                                                                                | 14                                                                                | 7                                                                                 | 179                                                                                 | 493                                                                                 | 40                                                                                  | 21                                                                                  | 496                                                                                 | 75                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 0.99                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 74                                                                                | 20                                                                                | 12                                                                                | 45                                                                                | 15                                                                                | 0                                                                                 | 195                                                                                 | 536                                                                                 | 0                                                                                   | 23                                                                                  | 539                                                                                 | 32                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 284                                                                               | 50                                                                                | 193                                                                               | 258                                                                               | 227                                                                               | 0                                                                                 | 480                                                                                 | 900                                                                                 | 765                                                                                 | 437                                                                                 | 738                                                                                 | 624                                                                                 |
| Arrive On Green              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.00                                                                              | 0.10                                                                                | 0.48                                                                                | 0.00                                                                                | 0.02                                                                                | 0.40                                                                                | 0.40                                                                                |
| Sat Flow, veh/h              | 1087                                                                              | 409                                                                               | 1583                                                                              | 1372                                                                              | 1863                                                                              | 0                                                                                 | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1575                                                                                |
| Grp Volume(v), veh/h         | 94                                                                                | 0                                                                                 | 12                                                                                | 45                                                                                | 15                                                                                | 0                                                                                 | 195                                                                                 | 536                                                                                 | 0                                                                                   | 23                                                                                  | 539                                                                                 | 32                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1496                                                                              | 0                                                                                 | 1583                                                                              | 1372                                                                              | 1863                                                                              | 0                                                                                 | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1575                                                                                |
| Q Serve(g_s), s              | 2.1                                                                               | 0.0                                                                               | 0.3                                                                               | 1.3                                                                               | 0.3                                                                               | 0.0                                                                               | 2.5                                                                                 | 8.8                                                                                 | 0.0                                                                                 | 0.3                                                                                 | 10.4                                                                                | 0.5                                                                                 |
| Cycle Q Clear(g_c), s        | 2.4                                                                               | 0.0                                                                               | 0.3                                                                               | 3.8                                                                               | 0.3                                                                               | 0.0                                                                               | 2.5                                                                                 | 8.8                                                                                 | 0.0                                                                                 | 0.3                                                                                 | 10.4                                                                                | 0.5                                                                                 |
| Prop In Lane                 | 0.79                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 334                                                                               | 0                                                                                 | 193                                                                               | 258                                                                               | 227                                                                               | 0                                                                                 | 480                                                                                 | 900                                                                                 | 765                                                                                 | 437                                                                                 | 738                                                                                 | 624                                                                                 |
| V/C Ratio(X)                 | 0.28                                                                              | 0.00                                                                              | 0.06                                                                              | 0.17                                                                              | 0.07                                                                              | 0.00                                                                              | 0.41                                                                                | 0.60                                                                                | 0.00                                                                                | 0.05                                                                                | 0.73                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h        | 1025                                                                              | 0                                                                                 | 936                                                                               | 902                                                                               | 1101                                                                              | 0                                                                                 | 925                                                                                 | 2246                                                                                | 1909                                                                                | 1036                                                                                | 2246                                                                                | 1899                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 0.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 17.4                                                                              | 0.0                                                                               | 16.4                                                                              | 19.2                                                                              | 16.4                                                                              | 0.0                                                                               | 7.5                                                                                 | 7.9                                                                                 | 0.0                                                                                 | 7.7                                                                                 | 10.9                                                                                | 7.9                                                                                 |
| Incr Delay (d2), s/veh       | 0.5                                                                               | 0.0                                                                               | 0.1                                                                               | 0.3                                                                               | 0.1                                                                               | 0.0                                                                               | 0.6                                                                                 | 0.6                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 1.4                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.1                                                                               | 0.0                                                                               | 0.1                                                                               | 0.5                                                                               | 0.2                                                                               | 0.0                                                                               | 1.3                                                                                 | 4.6                                                                                 | 0.0                                                                                 | 0.2                                                                                 | 5.5                                                                                 | 0.2                                                                                 |
| LnGrp Delay(d),s/veh         | 17.8                                                                              | 0.0                                                                               | 16.6                                                                              | 19.5                                                                              | 16.6                                                                              | 0.0                                                                               | 8.0                                                                                 | 8.6                                                                                 | 0.0                                                                                 | 7.8                                                                                 | 12.3                                                                                | 7.9                                                                                 |
| LnGrp LOS                    | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                 | B                                                                                 |                                                                                   | A                                                                                   | A                                                                                   |                                                                                     | A                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 106                                                                               |                                                                                   |                                                                                   | 60                                                                                |                                                                                   |                                                                                     | 731                                                                                 |                                                                                     |                                                                                     | 594                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 17.7                                                                              |                                                                                   |                                                                                   | 18.8                                                                              |                                                                                   |                                                                                     | 8.4                                                                                 |                                                                                     |                                                                                     | 11.9                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.7                                                                               | 26.4                                                                              |                                                                                   | 10.1                                                                              | 9.4                                                                               | 22.7                                                                              |                                                                                     | 10.1                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 51.0                                                                              |                                                                                   | 25.0                                                                              | 15.0                                                                              | 51.0                                                                              |                                                                                     | 25.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.3                                                                               | 10.8                                                                              |                                                                                   | 4.4                                                                               | 4.5                                                                               | 12.4                                                                              |                                                                                     | 5.8                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 3.8                                                                               |                                                                                   | 0.5                                                                               | 0.4                                                                               | 3.9                                                                               |                                                                                     | 0.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 10.9                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 3: Honoapiilani Highway & Akahele Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 53                                                                                | 3                                                                                 | 88                                                                                | 9                                                                                 | 5                                                                                 | 6                                                                                 | 151                                                                                | 703                                                                                 | 7                                                                                   | 1                                                                                   | 670                                                                                 | 70                                                                                  |
| Future Volume (veh/h)        | 53                                                                                | 3                                                                                 | 88                                                                                | 9                                                                                 | 5                                                                                 | 6                                                                                 | 151                                                                                | 703                                                                                 | 7                                                                                   | 1                                                                                   | 670                                                                                 | 70                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                  | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 58                                                                                | 3                                                                                 | 7                                                                                 | 10                                                                                | 5                                                                                 | 0                                                                                 | 164                                                                                | 764                                                                                 | 5                                                                                   | 1                                                                                   | 728                                                                                 | 35                                                                                  |
| Adj No. of Lanes             | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 75                                                                                | 63                                                                                | 147                                                                               | 18                                                                                | 180                                                                               | 153                                                                               | 210                                                                                | 1075                                                                                | 914                                                                                 | 3                                                                                   | 856                                                                                 | 726                                                                                 |
| Arrive On Green              | 0.04                                                                              | 0.13                                                                              | 0.13                                                                              | 0.01                                                                              | 0.10                                                                              | 0.00                                                                              | 0.12                                                                               | 0.58                                                                                | 0.58                                                                                | 0.00                                                                                | 0.46                                                                                | 0.46                                                                                |
| Sat Flow, veh/h              | 1774                                                                              | 488                                                                               | 1139                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1580                                                                                |
| Grp Volume(v), veh/h         | 58                                                                                | 0                                                                                 | 10                                                                                | 10                                                                                | 5                                                                                 | 0                                                                                 | 164                                                                                | 764                                                                                 | 5                                                                                   | 1                                                                                   | 728                                                                                 | 35                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1774                                                                              | 0                                                                                 | 1628                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1580                                                                                |
| Q Serve(g_s), s              | 2.3                                                                               | 0.0                                                                               | 0.4                                                                               | 0.4                                                                               | 0.2                                                                               | 0.0                                                                               | 6.3                                                                                | 20.8                                                                                | 0.1                                                                                 | 0.0                                                                                 | 24.5                                                                                | 0.9                                                                                 |
| Cycle Q Clear(g_c), s        | 2.3                                                                               | 0.0                                                                               | 0.4                                                                               | 0.4                                                                               | 0.2                                                                               | 0.0                                                                               | 6.3                                                                                | 20.8                                                                                | 0.1                                                                                 | 0.0                                                                                 | 24.5                                                                                | 0.9                                                                                 |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 0.70                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 75                                                                                | 0                                                                                 | 210                                                                               | 18                                                                                | 180                                                                               | 153                                                                               | 210                                                                                | 1075                                                                                | 914                                                                                 | 3                                                                                   | 856                                                                                 | 726                                                                                 |
| V/C Ratio(X)                 | 0.78                                                                              | 0.00                                                                              | 0.05                                                                              | 0.56                                                                              | 0.03                                                                              | 0.00                                                                              | 0.78                                                                               | 0.71                                                                                | 0.01                                                                                | 0.40                                                                                | 0.85                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h        | 502                                                                               | 0                                                                                 | 484                                                                               | 502                                                                               | 554                                                                               | 471                                                                               | 628                                                                                | 1714                                                                                | 1457                                                                                | 628                                                                                 | 1714                                                                                | 1454                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 33.5                                                                              | 0.0                                                                               | 27.0                                                                              | 34.8                                                                              | 28.9                                                                              | 0.0                                                                               | 30.2                                                                               | 10.7                                                                                | 6.3                                                                                 | 35.3                                                                                | 16.9                                                                                | 10.6                                                                                |
| Incr Delay (d2), s/veh       | 15.7                                                                              | 0.0                                                                               | 0.1                                                                               | 24.5                                                                              | 0.1                                                                               | 0.0                                                                               | 6.2                                                                                | 0.9                                                                                 | 0.0                                                                                 | 79.3                                                                                | 2.5                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.4                                                                               | 0.0                                                                               | 0.2                                                                               | 0.3                                                                               | 0.1                                                                               | 0.0                                                                               | 3.5                                                                                | 10.7                                                                                | 0.0                                                                                 | 0.1                                                                                 | 13.1                                                                                | 0.4                                                                                 |
| LnGrp Delay(d),s/veh         | 49.2                                                                              | 0.0                                                                               | 27.1                                                                              | 59.3                                                                              | 29.0                                                                              | 0.0                                                                               | 36.4                                                                               | 11.6                                                                                | 6.3                                                                                 | 114.5                                                                               | 19.4                                                                                | 10.6                                                                                |
| LnGrp LOS                    | D                                                                                 |                                                                                   | C                                                                                 | E                                                                                 | C                                                                                 |                                                                                   | D                                                                                  | B                                                                                   | A                                                                                   | F                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          | 68                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 15                                                                                |                                                                                    | 933                                                                                 |                                                                                     | 764                                                                                 |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 45.9                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 49.2                                                                              |                                                                                    | 15.9                                                                                |                                                                                     | 19.1                                                                                |                                                                                     |                                                                                     |
| Approach LOS                 | D                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                    | B                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.1                                                                               | 45.8                                                                              | 5.7                                                                               | 14.1                                                                              | 13.4                                                                              | 37.5                                                                              | 8.0                                                                                | 11.8                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              | 25.0                                                                              | 65.0                                                                              | 20.0                                                                               | 21.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.0                                                                               | 22.8                                                                              | 2.4                                                                               | 2.4                                                                               | 8.3                                                                               | 26.5                                                                              | 4.3                                                                                | 2.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 6.4                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 6.0                                                                               | 0.1                                                                                | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 18.7                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 4: Honoapiilani Highway & Lower Honoapiilani Road

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 70                                                                                | 4                                                                                 | 546                                                                               | 75                                                                                | 10                                                                                | 7                                                                                 | 548                                                                                | 757                                                                                 | 6                                                                                   | 1                                                                                   | 708                                                                                 | 16                                                                                  |
| Future Volume (veh/h)        | 70                                                                                | 4                                                                                 | 546                                                                               | 75                                                                                | 10                                                                                | 7                                                                                 | 548                                                                                | 757                                                                                 | 6                                                                                   | 1                                                                                   | 708                                                                                 | 16                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 76                                                                                | 4                                                                                 | 0                                                                                 | 82                                                                                | 11                                                                                | 6                                                                                 | 596                                                                                | 823                                                                                 | 7                                                                                   | 1                                                                                   | 770                                                                                 | 4                                                                                   |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 231                                                                               | 7                                                                                 | 141                                                                               | 206                                                                               | 16                                                                                | 9                                                                                 | 652                                                                                | 2543                                                                                | 22                                                                                  | 2                                                                                   | 1206                                                                                | 540                                                                                 |
| Arrive On Green              | 0.10                                                                              | 0.09                                                                              | 0.00                                                                              | 0.10                                                                              | 0.09                                                                              | 0.09                                                                              | 0.37                                                                               | 0.71                                                                                | 0.71                                                                                | 0.00                                                                                | 0.34                                                                                | 0.34                                                                                |
| Sat Flow, veh/h              | 1524                                                                              | 80                                                                                | 1583                                                                              | 1317                                                                              | 177                                                                               | 96                                                                                | 1774                                                                               | 3596                                                                                | 31                                                                                  | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 80                                                                                | 0                                                                                 | 0                                                                                 | 99                                                                                | 0                                                                                 | 0                                                                                 | 596                                                                                | 405                                                                                 | 425                                                                                 | 1                                                                                   | 770                                                                                 | 4                                                                                   |
| Grp Sat Flow(s),veh/h/ln     | 1604                                                                              | 0                                                                                 | 1583                                                                              | 1590                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                               | 1770                                                                                | 1857                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 1.0                                                                               | 0.0                                                                               | 0.0                                                                               | 23.7                                                                               | 6.4                                                                                 | 6.4                                                                                 | 0.0                                                                                 | 13.6                                                                                | 0.1                                                                                 |
| Cycle Q Clear(g_c), s        | 3.1                                                                               | 0.0                                                                               | 0.0                                                                               | 4.1                                                                               | 0.0                                                                               | 0.0                                                                               | 23.7                                                                               | 6.4                                                                                 | 6.4                                                                                 | 0.0                                                                                 | 13.6                                                                                | 0.1                                                                                 |
| Prop In Lane                 | 0.95                                                                              |                                                                                   | 1.00                                                                              | 0.83                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                               |                                                                                     | 0.02                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 260                                                                               | 0                                                                                 | 141                                                                               | 252                                                                               | 0                                                                                 | 0                                                                                 | 652                                                                                | 1252                                                                                | 1314                                                                                | 2                                                                                   | 1206                                                                                | 540                                                                                 |
| V/C Ratio(X)                 | 0.31                                                                              | 0.00                                                                              | 0.00                                                                              | 0.39                                                                              | 0.00                                                                              | 0.00                                                                              | 0.91                                                                               | 0.32                                                                                | 0.32                                                                                | 0.42                                                                                | 0.64                                                                                | 0.01                                                                                |
| Avail Cap(c_a), veh/h        | 514                                                                               | 0                                                                                 | 428                                                                               | 614                                                                               | 0                                                                                 | 0                                                                                 | 1703                                                                               | 1651                                                                                | 1733                                                                                | 1703                                                                                | 3302                                                                                | 1477                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 31.7                                                                              | 0.0                                                                               | 0.0                                                                               | 32.1                                                                              | 0.0                                                                               | 0.0                                                                               | 22.3                                                                               | 4.1                                                                                 | 4.1                                                                                 | 36.9                                                                                | 20.5                                                                                | 16.1                                                                                |
| Incr Delay (d2), s/veh       | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 1.0                                                                               | 0.0                                                                               | 0.0                                                                               | 2.2                                                                                | 0.3                                                                                 | 0.3                                                                                 | 37.7                                                                                | 1.2                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.6                                                                               | 0.0                                                                               | 0.0                                                                               | 2.0                                                                               | 0.0                                                                               | 0.0                                                                               | 11.8                                                                               | 3.1                                                                                 | 3.3                                                                                 | 0.0                                                                                 | 6.8                                                                                 | 0.1                                                                                 |
| LnGrp Delay(d),s/veh         | 32.3                                                                              | 0.0                                                                               | 0.0                                                                               | 33.1                                                                              | 0.0                                                                               | 0.0                                                                               | 24.5                                                                               | 4.4                                                                                 | 4.4                                                                                 | 74.6                                                                                | 21.8                                                                                | 16.1                                                                                |
| LnGrp LOS                    | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                  | A                                                                                   | A                                                                                   | E                                                                                   | C                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 80                                                                                |                                                                                   |                                                                                   | 99                                                                                |                                                                                   |                                                                                    | 1426                                                                                |                                                                                     |                                                                                     | 775                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 32.3                                                                              |                                                                                   |                                                                                   | 33.1                                                                              |                                                                                   |                                                                                    | 12.8                                                                                |                                                                                     |                                                                                     | 21.8                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 31.2                                                                              | 31.2                                                                              |                                                                                   | 11.6                                                                              | 4.1                                                                               | 58.3                                                                              |                                                                                    | 11.6                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 71.0                                                                              | 69.0                                                                              |                                                                                   | 25.0                                                                              | 71.0                                                                              | 69.0                                                                              |                                                                                    | 20.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 25.7                                                                              | 15.6                                                                              |                                                                                   | 6.1                                                                               | 2.0                                                                               | 8.4                                                                               |                                                                                    | 5.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 1.5                                                                               | 9.6                                                                               |                                                                                   | 0.3                                                                               | 0.0                                                                               | 9.7                                                                               |                                                                                    | 0.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 17.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 5: Honoapiilani Highway & Halawai Drive

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|--|--|--|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |  |  |  |  |  |  |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 20                                                                                | 1                                                                                 | 63                                                                                | 14                                                                                | 0                                                                                 | 4                                                                                 | 68                                                                                  | 1272                                                                                | 10                                                                                  | 8                                                                                   | 1332                                                                                | 33                                                                                  |  |  |  |  |  |  |
| Future Volume (veh/h)        | 20                                                                                | 1                                                                                 | 63                                                                                | 14                                                                                | 0                                                                                 | 4                                                                                 | 68                                                                                  | 1272                                                                                | 10                                                                                  | 8                                                                                   | 1332                                                                                | 33                                                                                  |  |  |  |  |  |  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |  |  |  |  |  |  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |  |  |  |  |  |  |
| Ped-Bike Adj(A_pbT)          | 0.97                                                                              |                                                                                   | 0.96                                                                              | 0.97                                                                              |                                                                                   | 0.96                                                                              | 1.00                                                                                |                                                                                     | 0.99                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |  |  |  |  |  |  |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |  |  |  |  |  |  |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |  |  |  |  |  |  |
| Adj Flow Rate, veh/h         | 22                                                                                | 1                                                                                 | 2                                                                                 | 15                                                                                | 0                                                                                 | 1                                                                                 | 74                                                                                  | 1383                                                                                | 11                                                                                  | 9                                                                                   | 1448                                                                                | 23                                                                                  |  |  |  |  |  |  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |  |  |  |  |  |  |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |  |  |  |  |  |  |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |  |  |  |  |  |  |
| Cap, veh/h                   | 247                                                                               | 9                                                                                 | 166                                                                               | 225                                                                               | 3                                                                                 | 9                                                                                 | 95                                                                                  | 2475                                                                                | 20                                                                                  | 12                                                                                  | 2268                                                                                | 1015                                                                                |  |  |  |  |  |  |
| Arrive On Green              | 0.12                                                                              | 0.11                                                                              | 0.11                                                                              | 0.12                                                                              | 0.00                                                                              | 0.11                                                                              | 0.05                                                                                | 0.69                                                                                | 0.69                                                                                | 0.01                                                                                | 0.64                                                                                | 0.64                                                                                |  |  |  |  |  |  |
| Sat Flow, veh/h              | 1355                                                                              | 81                                                                                | 1518                                                                              | 1160                                                                              | 26                                                                                | 79                                                                                | 1774                                                                                | 3599                                                                                | 29                                                                                  | 1774                                                                                | 3539                                                                                | 1583                                                                                |  |  |  |  |  |  |
| Grp Volume(v), veh/h         | 23                                                                                | 0                                                                                 | 2                                                                                 | 16                                                                                | 0                                                                                 | 0                                                                                 | 74                                                                                  | 680                                                                                 | 714                                                                                 | 9                                                                                   | 1448                                                                                | 23                                                                                  |  |  |  |  |  |  |
| Grp Sat Flow(s),veh/h/ln     | 1435                                                                              | 0                                                                                 | 1518                                                                              | 1265                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1858                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |  |  |  |  |  |  |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.1                                                                               | 0.6                                                                               | 0.0                                                                               | 0.0                                                                               | 2.9                                                                                 | 13.9                                                                                | 13.9                                                                                | 0.4                                                                                 | 17.8                                                                                | 0.4                                                                                 |  |  |  |  |  |  |
| Cycle Q Clear(g_c), s        | 0.8                                                                               | 0.0                                                                               | 0.1                                                                               | 1.4                                                                               | 0.0                                                                               | 0.0                                                                               | 2.9                                                                                 | 13.9                                                                                | 13.9                                                                                | 0.4                                                                                 | 17.8                                                                                | 0.4                                                                                 |  |  |  |  |  |  |
| Prop In Lane                 | 0.96                                                                              |                                                                                   | 1.00                                                                              | 0.94                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                                |                                                                                     | 0.02                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |  |  |  |  |  |  |
| Lane Grp Cap(c), veh/h       | 276                                                                               | 0                                                                                 | 166                                                                               | 254                                                                               | 0                                                                                 | 0                                                                                 | 95                                                                                  | 1217                                                                                | 1277                                                                                | 12                                                                                  | 2268                                                                                | 1015                                                                                |  |  |  |  |  |  |
| V/C Ratio(X)                 | 0.08                                                                              | 0.00                                                                              | 0.01                                                                              | 0.06                                                                              | 0.00                                                                              | 0.00                                                                              | 0.78                                                                                | 0.56                                                                                | 0.56                                                                                | 0.74                                                                                | 0.64                                                                                | 0.02                                                                                |  |  |  |  |  |  |
| Avail Cap(c_a), veh/h        | 569                                                                               | 0                                                                                 | 489                                                                               | 545                                                                               | 0                                                                                 | 0                                                                                 | 522                                                                                 | 2131                                                                                | 2236                                                                                | 273                                                                                 | 3766                                                                                | 1685                                                                                |  |  |  |  |  |  |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |  |  |  |  |  |  |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |  |  |  |  |  |  |
| Uniform Delay (d), s/veh     | 28.3                                                                              | 0.0                                                                               | 28.4                                                                              | 28.7                                                                              | 0.0                                                                               | 0.0                                                                               | 33.4                                                                                | 5.7                                                                                 | 5.7                                                                                 | 35.4                                                                                | 7.8                                                                                 | 4.7                                                                                 |  |  |  |  |  |  |
| Incr Delay (d2), s/veh       | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 5.0                                                                                 | 0.9                                                                                 | 0.8                                                                                 | 27.1                                                                                | 0.6                                                                                 | 0.0                                                                                 |  |  |  |  |  |  |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |  |  |  |  |  |  |
| %ile BackOfQ(50%),veh/ln     | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 0.3                                                                               | 0.0                                                                               | 0.0                                                                               | 1.6                                                                                 | 6.9                                                                                 | 7.2                                                                                 | 0.3                                                                                 | 8.6                                                                                 | 0.2                                                                                 |  |  |  |  |  |  |
| LnGrp Delay(d),s/veh         | 28.3                                                                              | 0.0                                                                               | 28.4                                                                              | 28.7                                                                              | 0.0                                                                               | 0.0                                                                               | 38.4                                                                                | 6.5                                                                                 | 6.5                                                                                 | 62.5                                                                                | 8.4                                                                                 | 4.7                                                                                 |  |  |  |  |  |  |
| LnGrp LOS                    | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                 |                                                                                   |                                                                                   | D                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | A                                                                                   | A                                                                                   |  |  |  |  |  |  |
| Approach Vol, veh/h          | 25                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 16                                                                                |                                                                                     | 1468                                                                                |                                                                                     |                                                                                     | 1480                                                                                |                                                                                     |  |  |  |  |  |  |
| Approach Delay, s/veh        | 28.3                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 28.7                                                                              |                                                                                     | 8.1                                                                                 |                                                                                     |                                                                                     | 8.7                                                                                 |                                                                                     |  |  |  |  |  |  |
| Approach LOS                 | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   | C                                                                                 |                                                                                     | A                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |  |  |  |  |  |  |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |
| Phs Duration (G+Y+Rc), s     | 7.8                                                                               | 50.8                                                                              |                                                                                   |                                                                                   | 12.8                                                                              | 4.5                                                                               | 54.1                                                                                | 12.8                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                                 | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |
| Max Green Setting (Gmax), s  | 21.0                                                                              | 76.0                                                                              |                                                                                   |                                                                                   | 23.0                                                                              | 11.0                                                                              | 86.0                                                                                | 23.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |
| Max Q Clear Time (g_c+I1), s | 4.9                                                                               | 19.8                                                                              |                                                                                   |                                                                                   | 3.4                                                                               | 2.4                                                                               | 15.9                                                                                | 2.8                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |
| Green Ext Time (p_c), s      | 0.0                                                                               | 26.0                                                                              |                                                                                   |                                                                                   | 0.0                                                                               | 0.0                                                                               | 24.2                                                                                | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |
| HCM 2010 Ctrl Delay          | 8.7                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |
| HCM 2010 LOS                 | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |

# HCM 2010 Signalized Intersection Summary

## 6: Honoapiilani Highway & Kai Ala Drive/Puukolii Road

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 64                                                                                | 5                                                                                 | 164                                                                               | 63                                                                                | 4                                                                                 | 40                                                                                | 121                                                                                | 1208                                                                                | 55                                                                                  | 29                                                                                  | 1332                                                                                | 83                                                                                  |
| Future Volume (veh/h)        | 64                                                                                | 5                                                                                 | 164                                                                               | 63                                                                                | 4                                                                                 | 40                                                                                | 121                                                                                | 1208                                                                                | 55                                                                                  | 29                                                                                  | 1332                                                                                | 83                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.98                                                                              | 0.99                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 70                                                                                | 5                                                                                 | 3                                                                                 | 68                                                                                | 4                                                                                 | 1                                                                                 | 132                                                                                | 1313                                                                                | 45                                                                                  | 32                                                                                  | 1448                                                                                | 65                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 2                                                                                   | 1                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 196                                                                               | 13                                                                                | 186                                                                               | 139                                                                               | 171                                                                               | 43                                                                                | 153                                                                                | 2712                                                                                | 1212                                                                                | 41                                                                                  | 2490                                                                                | 1114                                                                                |
| Arrive On Green              | 0.13                                                                              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.09                                                                               | 0.77                                                                                | 0.77                                                                                | 0.02                                                                                | 0.70                                                                                | 0.70                                                                                |
| Sat Flow, veh/h              | 1290                                                                              | 105                                                                               | 1559                                                                              | 1385                                                                              | 1434                                                                              | 359                                                                               | 1774                                                                               | 3539                                                                                | 1582                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 75                                                                                | 0                                                                                 | 3                                                                                 | 68                                                                                | 0                                                                                 | 5                                                                                 | 132                                                                                | 1313                                                                                | 45                                                                                  | 32                                                                                  | 1448                                                                                | 65                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1395                                                                              | 0                                                                                 | 1559                                                                              | 1385                                                                              | 0                                                                                 | 1793                                                                              | 1774                                                                               | 1770                                                                                | 1582                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 7.9                                                                               | 0.0                                                                               | 0.3                                                                               | 7.9                                                                               | 0.0                                                                               | 0.4                                                                               | 12.1                                                                               | 22.7                                                                                | 1.1                                                                                 | 3.0                                                                                 | 33.9                                                                                | 2.1                                                                                 |
| Cycle Q Clear(g_c), s        | 8.3                                                                               | 0.0                                                                               | 0.3                                                                               | 16.3                                                                              | 0.0                                                                               | 0.4                                                                               | 12.1                                                                               | 22.7                                                                                | 1.1                                                                                 | 3.0                                                                                 | 33.9                                                                                | 2.1                                                                                 |
| Prop In Lane                 | 0.93                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.20                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 217                                                                               | 0                                                                                 | 186                                                                               | 139                                                                               | 0                                                                                 | 214                                                                               | 153                                                                                | 2712                                                                                | 1212                                                                                | 41                                                                                  | 2490                                                                                | 1114                                                                                |
| V/C Ratio(X)                 | 0.35                                                                              | 0.00                                                                              | 0.02                                                                              | 0.49                                                                              | 0.00                                                                              | 0.02                                                                              | 0.86                                                                               | 0.48                                                                                | 0.04                                                                                | 0.77                                                                                | 0.58                                                                                | 0.06                                                                                |
| Avail Cap(c_a), veh/h        | 254                                                                               | 0                                                                                 | 227                                                                               | 175                                                                               | 0                                                                                 | 261                                                                               | 226                                                                                | 2712                                                                                | 1212                                                                                | 108                                                                                 | 2490                                                                                | 1114                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.78                                                                               | 0.78                                                                                | 0.78                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 67.3                                                                              | 0.0                                                                               | 64.1                                                                              | 75.2                                                                              | 0.0                                                                               | 64.1                                                                              | 74.4                                                                               | 7.2                                                                                 | 4.6                                                                                 | 80.1                                                                                | 12.3                                                                                | 7.6                                                                                 |
| Incr Delay (d2), s/veh       | 0.9                                                                               | 0.0                                                                               | 0.0                                                                               | 2.6                                                                               | 0.0                                                                               | 0.0                                                                               | 11.5                                                                               | 0.5                                                                                 | 0.0                                                                                 | 10.8                                                                                | 1.0                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 3.2                                                                               | 0.0                                                                               | 0.1                                                                               | 3.1                                                                               | 0.0                                                                               | 0.2                                                                               | 6.4                                                                                | 11.1                                                                                | 0.5                                                                                 | 1.6                                                                                 | 16.8                                                                                | 1.0                                                                                 |
| LnGrp Delay(d),s/veh         | 68.2                                                                              | 0.0                                                                               | 64.1                                                                              | 77.8                                                                              | 0.0                                                                               | 64.2                                                                              | 86.0                                                                               | 7.6                                                                                 | 4.7                                                                                 | 90.9                                                                                | 13.3                                                                                | 7.7                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                 |                                                                                   | E                                                                                 | F                                                                                  | A                                                                                   | A                                                                                   | F                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 78                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 73                                                                                |                                                                                    | 1490                                                                                |                                                                                     |                                                                                     | 1545                                                                                |                                                                                     |
| Approach Delay, s/veh        | 68.1                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 76.9                                                                              |                                                                                    | 14.5                                                                                |                                                                                     |                                                                                     | 14.6                                                                                |                                                                                     |
| Approach LOS                 | E                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   | E                                                                                 |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 4                                                                                 |                                                                                   | 5                                                                                 | 6                                                                                 | 8                                                                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 18.2                                                                              | 122.1                                                                             | 24.7                                                                              |                                                                                   | 7.8                                                                               | 132.4                                                                             | 24.7                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 6.0                                                                               | 5.0                                                                               |                                                                                   | 4.0                                                                               | 6.0                                                                               | 5.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 21.0                                                                              | 105.0                                                                             | 24.0                                                                              |                                                                                   | 10.0                                                                              | 116.0                                                                             | 24.0                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 14.1                                                                              | 35.9                                                                              | 18.3                                                                              |                                                                                   | 5.0                                                                               | 24.7                                                                              | 10.3                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.1                                                                               | 29.2                                                                              | 0.1                                                                               |                                                                                   | 0.0                                                                               | 25.6                                                                              | 0.2                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 17.3                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 7: Honoapiilani Highway & Kaanapali Parkway/Halelo Street

08/09/2017

|                              |  |  |                                                                                    |  |  |  |                                                                                       |                                                                                      |  |  |                                                                                      |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                                                                                                                 | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                                                                                                     | NBT                                                                                                                                                                     | NBR                                                                                 | SBL                                                                                 | SBT                                                                                                                                                                     | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |   |                                                                                   |  |                                                                                   |   |   |                                                                                     |  |   |  |
| Traffic Volume (veh/h)       | 265                                                                               | 2                                                                                 | 597                                                                                                                                                                 | 13                                                                                | 0                                                                                 | 4                                                                                 | 374                                                                                                                                                                     | 1240                                                                                                                                                                    | 6                                                                                   | 48                                                                                  | 1416                                                                                                                                                                    | 120                                                                                 |
| Future Volume (veh/h)        | 265                                                                               | 2                                                                                 | 597                                                                                                                                                                 | 13                                                                                | 0                                                                                 | 4                                                                                 | 374                                                                                                                                                                     | 1240                                                                                                                                                                    | 6                                                                                   | 48                                                                                  | 1416                                                                                                                                                                    | 120                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                                                                                                  | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                                                                                                       | 6                                                                                                                                                                       | 16                                                                                  | 5                                                                                   | 2                                                                                                                                                                       | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                                                                                                   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                                                                                                       | 0                                                                                                                                                                       | 0                                                                                   | 0                                                                                   | 0                                                                                                                                                                       | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 0.99                                                                                                                                                                | 1.00                                                                              |                                                                                   | 0.96                                                                              | 1.00                                                                                                                                                                    |                                                                                                                                                                         | 1.00                                                                                | 1.00                                                                                |                                                                                                                                                                         | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                                                                                                | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                                                                                                    | 1.00                                                                                                                                                                    | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                                                                                                    | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                                                                                                                | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                                                                                                    | 1863                                                                                                                                                                    | 1900                                                                                | 1863                                                                                | 1863                                                                                                                                                                    | 1863                                                                                |
| Adj Flow Rate, veh/h         | 288                                                                               | 2                                                                                 | 453                                                                                                                                                                 | 14                                                                                | 0                                                                                 | 1                                                                                 | 407                                                                                                                                                                     | 1348                                                                                                                                                                    | 7                                                                                   | 52                                                                                  | 1539                                                                                                                                                                    | 94                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 2                                                                                                                                                                   | 0                                                                                 | 1                                                                                 | 0                                                                                 | 2                                                                                                                                                                       | 2                                                                                                                                                                       | 0                                                                                   | 1                                                                                   | 2                                                                                                                                                                       | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                                                                                                | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                                                                                                    | 0.92                                                                                                                                                                    | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                                                                                                    | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                                                                                                   | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                                                                                                       | 2                                                                                                                                                                       | 2                                                                                   | 2                                                                                   | 2                                                                                                                                                                       | 2                                                                                   |
| Cap, veh/h                   | 349                                                                               | 2                                                                                 | 929                                                                                                                                                                 | 78                                                                                | 0                                                                                 | 6                                                                                 | 493                                                                                                                                                                     | 2216                                                                                                                                                                    | 12                                                                                  | 91                                                                                  | 1847                                                                                                                                                                    | 826                                                                                 |
| Arrive On Green              | 0.20                                                                              | 0.20                                                                              | 0.19                                                                                                                                                                | 0.05                                                                              | 0.00                                                                              | 0.03                                                                              | 0.14                                                                                                                                                                    | 0.61                                                                                                                                                                    | 0.60                                                                                | 0.05                                                                                | 0.52                                                                                                                                                                    | 0.52                                                                                |
| Sat Flow, veh/h              | 1762                                                                              | 12                                                                                | 2758                                                                                                                                                                | 1638                                                                              | 0                                                                                 | 117                                                                               | 3442                                                                                                                                                                    | 3610                                                                                                                                                                    | 19                                                                                  | 1774                                                                                | 3539                                                                                                                                                                    | 1583                                                                                |
| Grp Volume(v), veh/h         | 290                                                                               | 0                                                                                 | 453                                                                                                                                                                 | 15                                                                                | 0                                                                                 | 0                                                                                 | 407                                                                                                                                                                     | 661                                                                                                                                                                     | 694                                                                                 | 52                                                                                  | 1539                                                                                                                                                                    | 94                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1775                                                                              | 0                                                                                 | 1379                                                                                                                                                                | 1755                                                                              | 0                                                                                 | 0                                                                                 | 1721                                                                                                                                                                    | 1770                                                                                                                                                                    | 1859                                                                                | 1774                                                                                | 1770                                                                                                                                                                    | 1583                                                                                |
| Q Serve(g_s), s              | 27.9                                                                              | 0.0                                                                               | 23.3                                                                                                                                                                | 1.5                                                                               | 0.0                                                                               | 0.0                                                                               | 20.5                                                                                                                                                                    | 41.0                                                                                                                                                                    | 41.1                                                                                | 5.1                                                                                 | 65.6                                                                                                                                                                    | 5.4                                                                                 |
| Cycle Q Clear(g_c), s        | 27.9                                                                              | 0.0                                                                               | 23.3                                                                                                                                                                | 1.5                                                                               | 0.0                                                                               | 0.0                                                                               | 20.5                                                                                                                                                                    | 41.0                                                                                                                                                                    | 41.1                                                                                | 5.1                                                                                 | 65.6                                                                                                                                                                    | 5.4                                                                                 |
| Prop In Lane                 | 0.99                                                                              |                                                                                   | 1.00                                                                                                                                                                | 0.93                                                                              |                                                                                   | 0.07                                                                              | 1.00                                                                                                                                                                    |                                                                                                                                                                         | 0.01                                                                                | 1.00                                                                                |                                                                                                                                                                         | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 351                                                                               | 0                                                                                 | 929                                                                                                                                                                 | 83                                                                                | 0                                                                                 | 0                                                                                 | 493                                                                                                                                                                     | 1086                                                                                                                                                                    | 1141                                                                                | 91                                                                                  | 1847                                                                                                                                                                    | 826                                                                                 |
| V/C Ratio(X)                 | 0.83                                                                              | 0.00                                                                              | 0.49                                                                                                                                                                | 0.18                                                                              | 0.00                                                                              | 0.00                                                                              | 0.83                                                                                                                                                                    | 0.61                                                                                                                                                                    | 0.61                                                                                | 0.57                                                                                | 0.83                                                                                                                                                                    | 0.11                                                                                |
| Avail Cap(c_a), veh/h        | 557                                                                               | 0                                                                                 | 1250                                                                                                                                                                | 344                                                                               | 0                                                                                 | 0                                                                                 | 830                                                                                                                                                                     | 2074                                                                                                                                                                    | 2179                                                                                | 209                                                                                 | 3711                                                                                                                                                                    | 1660                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                                                                                                | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                                                                                                    | 1.00                                                                                                                                                                    | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                                                                                                    | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                                                                                                                | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                                                                                                                    | 1.00                                                                                                                                                                    | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                                                                                                    | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 68.6                                                                              | 0.0                                                                               | 47.1                                                                                                                                                                | 81.7                                                                              | 0.0                                                                               | 0.0                                                                               | 74.2                                                                                                                                                                    | 21.2                                                                                                                                                                    | 21.2                                                                                | 82.7                                                                                | 36.1                                                                                                                                                                    | 21.7                                                                                |
| Incr Delay (d2), s/veh       | 2.8                                                                               | 0.0                                                                               | 0.1                                                                                                                                                                 | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 1.4                                                                                                                                                                     | 0.8                                                                                                                                                                     | 0.8                                                                                 | 2.1                                                                                 | 1.5                                                                                                                                                                     | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                                                                                                 | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                                                                                                     | 0.0                                                                                                                                                                     | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                                                                                                     | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 14.0                                                                              | 0.0                                                                               | 8.9                                                                                                                                                                 | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 9.9                                                                                                                                                                     | 20.2                                                                                                                                                                    | 21.3                                                                                | 2.6                                                                                 | 32.4                                                                                                                                                                    | 2.4                                                                                 |
| LnGrp Delay(d),s/veh         | 71.4                                                                              | 0.0                                                                               | 47.3                                                                                                                                                                | 82.1                                                                              | 0.0                                                                               | 0.0                                                                               | 75.6                                                                                                                                                                    | 22.0                                                                                                                                                                    | 22.0                                                                                | 84.8                                                                                | 37.5                                                                                                                                                                    | 21.8                                                                                |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                                                                                                   | F                                                                                 |                                                                                   |                                                                                   | E                                                                                                                                                                       | C                                                                                                                                                                       | C                                                                                   | F                                                                                   | D                                                                                                                                                                       | C                                                                                   |
| Approach Vol, veh/h          | 743                                                                               |                                                                                   |                                                                                                                                                                     |                                                                                   |                                                                                   | 15                                                                                | 1762                                                                                                                                                                    |                                                                                                                                                                         |                                                                                     | 1685                                                                                |                                                                                                                                                                         |                                                                                     |
| Approach Delay, s/veh        | 56.7                                                                              |                                                                                   |                                                                                                                                                                     |                                                                                   |                                                                                   | 82.1                                                                              | 34.4                                                                                                                                                                    |                                                                                                                                                                         |                                                                                     | 38.1                                                                                |                                                                                                                                                                         |                                                                                     |
| Approach LOS                 | E                                                                                 |                                                                                   |                                                                                                                                                                     |                                                                                   |                                                                                   | F                                                                                 | C                                                                                                                                                                       |                                                                                                                                                                         |                                                                                     | D                                                                                   |                                                                                                                                                                         |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                                                                                                       | 8                                                                                                                                                                       |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 4                                                                                                                                                                   |                                                                                   | 5                                                                                 | 6                                                                                 | 8                                                                                                                                                                       |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 29.5                                                                              | 97.1                                                                              | 12.4                                                                                                                                                                |                                                                                   | 13.2                                                                              | 113.4                                                                             | 39.3                                                                                                                                                                    |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Change Period (Y+Rc), s      | 6.0                                                                               | 6.0                                                                               | 7.0                                                                                                                                                                 |                                                                                   | 6.0                                                                               | 6.0                                                                               | 7.0                                                                                                                                                                     |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Max Green Setting (Gmax), s  | 41.0                                                                              | 185.0                                                                             | 32.0                                                                                                                                                                |                                                                                   | 19.0                                                                              | 207.0                                                                             | 53.0                                                                                                                                                                    |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 22.5                                                                              | 67.6                                                                              | 3.5                                                                                                                                                                 |                                                                                   | 7.1                                                                               | 43.1                                                                              | 29.9                                                                                                                                                                    |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Green Ext Time (p_c), s      | 1.0                                                                               | 23.5                                                                              | 0.0                                                                                                                                                                 |                                                                                   | 0.0                                                                               | 14.4                                                                              | 2.3                                                                                                                                                                     |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                                                                                                     |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 40.0                                                                                                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | D                                                                                                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 8: Honoapiilani Highway & Leialii Parkway

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |                                                                                     |
| Traffic Volume (veh/h)       | 7                                                                                 | 0                                                                                 | 4                                                                                 | 85                                                                                | 2                                                                                 | 53                                                                                | 9                                                                                   | 1563                                                                                | 88                                                                                  | 77                                                                                  | 1953                                                                                | 4                                                                                   |
| Future Volume (veh/h)        | 7                                                                                 | 0                                                                                 | 4                                                                                 | 85                                                                                | 2                                                                                 | 53                                                                                | 9                                                                                   | 1563                                                                                | 88                                                                                  | 77                                                                                  | 1953                                                                                | 4                                                                                   |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 8                                                                                 | 0                                                                                 | 1                                                                                 | 92                                                                                | 2                                                                                 | 3                                                                                 | 10                                                                                  | 1699                                                                                | 94                                                                                  | 84                                                                                  | 2123                                                                                | 4                                                                                   |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 154                                                                               | 3                                                                                 | 13                                                                                | 175                                                                               | 57                                                                                | 85                                                                                | 21                                                                                  | 2608                                                                                | 143                                                                                 | 110                                                                                 | 2954                                                                                | 6                                                                                   |
| Arrive On Green              | 0.08                                                                              | 0.00                                                                              | 0.08                                                                              | 0.08                                                                              | 0.08                                                                              | 0.08                                                                              | 0.01                                                                                | 0.76                                                                                | 0.76                                                                                | 0.06                                                                                | 0.81                                                                                | 0.81                                                                                |
| Sat Flow, veh/h              | 1224                                                                              | 36                                                                                | 157                                                                               | 1410                                                                              | 674                                                                               | 1011                                                                              | 1774                                                                                | 3412                                                                                | 188                                                                                 | 1774                                                                                | 3624                                                                                | 7                                                                                   |
| Grp Volume(v), veh/h         | 9                                                                                 | 0                                                                                 | 0                                                                                 | 92                                                                                | 0                                                                                 | 5                                                                                 | 10                                                                                  | 876                                                                                 | 917                                                                                 | 84                                                                                  | 1036                                                                                | 1091                                                                                |
| Grp Sat Flow(s),veh/h/ln     | 1417                                                                              | 0                                                                                 | 0                                                                                 | 1410                                                                              | 0                                                                                 | 1684                                                                              | 1774                                                                                | 1770                                                                                | 1830                                                                                | 1774                                                                                | 1770                                                                                | 1862                                                                                |
| Q Serve(g_s), s              | 0.5                                                                               | 0.0                                                                               | 0.0                                                                               | 7.6                                                                               | 0.0                                                                               | 0.4                                                                               | 0.8                                                                                 | 31.2                                                                                | 32.0                                                                                | 6.3                                                                                 | 35.3                                                                                | 35.4                                                                                |
| Cycle Q Clear(g_c), s        | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 8.4                                                                               | 0.0                                                                               | 0.4                                                                               | 0.8                                                                                 | 31.2                                                                                | 32.0                                                                                | 6.3                                                                                 | 35.3                                                                                | 35.4                                                                                |
| Prop In Lane                 | 0.89                                                                              |                                                                                   | 0.11                                                                              | 1.00                                                                              |                                                                                   | 0.60                                                                              | 1.00                                                                                |                                                                                     | 0.10                                                                                | 1.00                                                                                |                                                                                     | 0.00                                                                                |
| Lane Grp Cap(c), veh/h       | 170                                                                               | 0                                                                                 | 0                                                                                 | 175                                                                               | 0                                                                                 | 142                                                                               | 21                                                                                  | 1353                                                                                | 1399                                                                                | 110                                                                                 | 1442                                                                                | 1517                                                                                |
| V/C Ratio(X)                 | 0.05                                                                              | 0.00                                                                              | 0.00                                                                              | 0.53                                                                              | 0.00                                                                              | 0.04                                                                              | 0.49                                                                                | 0.65                                                                                | 0.66                                                                                | 0.76                                                                                | 0.72                                                                                | 0.72                                                                                |
| Avail Cap(c_a), veh/h        | 303                                                                               | 0                                                                                 | 0                                                                                 | 306                                                                               | 0                                                                                 | 299                                                                               | 145                                                                                 | 1353                                                                                | 1399                                                                                | 250                                                                                 | 1442                                                                                | 1517                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.73                                                                                | 0.73                                                                                | 0.73                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 57.0                                                                              | 0.0                                                                               | 0.0                                                                               | 60.3                                                                              | 0.0                                                                               | 57.0                                                                              | 66.3                                                                                | 7.4                                                                                 | 7.5                                                                                 | 62.3                                                                                | 5.6                                                                                 | 5.6                                                                                 |
| Incr Delay (d2), s/veh       | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 2.4                                                                               | 0.0                                                                               | 0.1                                                                               | 4.8                                                                                 | 1.8                                                                                 | 1.8                                                                                 | 4.1                                                                                 | 3.1                                                                                 | 3.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.3                                                                               | 0.0                                                                               | 0.0                                                                               | 3.5                                                                               | 0.0                                                                               | 0.2                                                                               | 0.4                                                                                 | 15.5                                                                                | 16.5                                                                                | 3.2                                                                                 | 17.9                                                                                | 18.8                                                                                |
| LnGrp Delay(d),s/veh         | 57.1                                                                              | 0.0                                                                               | 0.0                                                                               | 62.8                                                                              | 0.0                                                                               | 57.1                                                                              | 71.1                                                                                | 9.2                                                                                 | 9.3                                                                                 | 66.4                                                                                | 8.7                                                                                 | 8.5                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 9                                                                                 |                                                                                   |                                                                                   |                                                                                   | 97                                                                                |                                                                                   | 1803                                                                                |                                                                                     |                                                                                     |                                                                                     | 2211                                                                                |                                                                                     |
| Approach Delay, s/veh        | 57.1                                                                              |                                                                                   |                                                                                   |                                                                                   | 62.5                                                                              |                                                                                   | 9.6                                                                                 |                                                                                     |                                                                                     |                                                                                     | 10.8                                                                                |                                                                                     |
| Approach LOS                 | E                                                                                 |                                                                                   |                                                                                   |                                                                                   | E                                                                                 |                                                                                   | A                                                                                   |                                                                                     |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.6                                                                               | 114.0                                                                             |                                                                                   |                                                                                   | 15.4                                                                              | 12.4                                                                              | 107.2                                                                               | 15.4                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                                 | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 11.0                                                                              | 87.0                                                                              |                                                                                   |                                                                                   | 23.0                                                                              | 19.0                                                                              | 79.0                                                                                | 23.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.8                                                                               | 37.4                                                                              |                                                                                   |                                                                                   | 10.4                                                                              | 8.3                                                                               | 34.0                                                                                | 2.8                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 40.6                                                                              |                                                                                   |                                                                                   | 0.2                                                                               | 0.1                                                                               | 30.6                                                                                | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 11.6                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 9: Honoapiilani Highway & Front Street/Flemming Road

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |                                                                                   |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 160                                                                               | 11                                                                                | 8                                                                                 | 59                                                                                | 5                                                                                 | 7                                                                                 | 5                                                                                   | 1504                                                                                | 20                                                                                  | 2                                                                                   | 1646                                                                                | 293                                                                                 |
| Future Volume (veh/h)        | 160                                                                               | 11                                                                                | 8                                                                                 | 59                                                                                | 5                                                                                 | 7                                                                                 | 5                                                                                   | 1504                                                                                | 20                                                                                  | 2                                                                                   | 1646                                                                                | 293                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 174                                                                               | 12                                                                                | 7                                                                                 | 64                                                                                | 5                                                                                 | 5                                                                                 | 5                                                                                   | 1635                                                                                | 21                                                                                  | 2                                                                                   | 1789                                                                                | 242                                                                                 |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 0                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 253                                                                               | 14                                                                                | 8                                                                                 | 260                                                                               | 20                                                                                | 17                                                                                | 7                                                                                   | 2719                                                                                | 35                                                                                  | 3                                                                                   | 2681                                                                                | 1200                                                                                |
| Arrive On Green              | 0.15                                                                              | 0.15                                                                              | 0.14                                                                              | 0.15                                                                              | 0.15                                                                              | 0.14                                                                              | 0.01                                                                                | 1.00                                                                                | 1.00                                                                                | 0.00                                                                                | 0.76                                                                                | 0.76                                                                                |
| Sat Flow, veh/h              | 1355                                                                              | 93                                                                                | 54                                                                                | 1408                                                                              | 137                                                                               | 112                                                                               | 1774                                                                                | 3578                                                                                | 46                                                                                  | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 193                                                                               | 0                                                                                 | 0                                                                                 | 74                                                                                | 0                                                                                 | 0                                                                                 | 5                                                                                   | 808                                                                                 | 848                                                                                 | 2                                                                                   | 1789                                                                                | 242                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1503                                                                              | 0                                                                                 | 0                                                                                 | 1656                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1855                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 11.5                                                                              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.2                                                                                 | 33.4                                                                                | 5.9                                                                                 |
| Cycle Q Clear(g_c), s        | 16.7                                                                              | 0.0                                                                               | 0.0                                                                               | 5.2                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.2                                                                                 | 33.4                                                                                | 5.9                                                                                 |
| Prop In Lane                 | 0.90                                                                              |                                                                                   | 0.04                                                                              | 0.86                                                                              |                                                                                   | 0.07                                                                              | 1.00                                                                                |                                                                                     | 0.02                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 276                                                                               | 0                                                                                 | 0                                                                                 | 298                                                                               | 0                                                                                 | 0                                                                                 | 7                                                                                   | 1345                                                                                | 1409                                                                                | 3                                                                                   | 2681                                                                                | 1200                                                                                |
| V/C Ratio(X)                 | 0.70                                                                              | 0.00                                                                              | 0.00                                                                              | 0.25                                                                              | 0.00                                                                              | 0.00                                                                              | 0.74                                                                                | 0.60                                                                                | 0.60                                                                                | 0.70                                                                                | 0.67                                                                                | 0.20                                                                                |
| Avail Cap(c_a), veh/h        | 379                                                                               | 0                                                                                 | 0                                                                                 | 401                                                                               | 0                                                                                 | 0                                                                                 | 105                                                                                 | 1345                                                                                | 1409                                                                                | 105                                                                                 | 2681                                                                                | 1200                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.73                                                                                | 0.73                                                                                | 0.73                                                                                | 0.60                                                                                | 0.60                                                                                | 0.60                                                                                |
| Uniform Delay (d), s/veh     | 55.6                                                                              | 0.0                                                                               | 0.0                                                                               | 51.0                                                                              | 0.0                                                                               | 0.0                                                                               | 66.9                                                                                | 0.0                                                                                 | 0.0                                                                                 | 67.4                                                                                | 8.0                                                                                 | 4.7                                                                                 |
| Incr Delay (d2), s/veh       | 3.4                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 34.7                                                                                | 1.5                                                                                 | 1.4                                                                                 | 51.9                                                                                | 0.8                                                                                 | 0.2                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 7.3                                                                               | 0.0                                                                               | 0.0                                                                               | 2.5                                                                               | 0.0                                                                               | 0.0                                                                               | 0.3                                                                                 | 0.5                                                                                 | 0.5                                                                                 | 0.1                                                                                 | 16.5                                                                                | 2.6                                                                                 |
| LnGrp Delay(d),s/veh         | 59.0                                                                              | 0.0                                                                               | 0.0                                                                               | 51.5                                                                              | 0.0                                                                               | 0.0                                                                               | 101.6                                                                               | 1.5                                                                                 | 1.4                                                                                 | 119.3                                                                               | 8.8                                                                                 | 4.9                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | F                                                                                   | A                                                                                   | A                                                                                   | F                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 193                                                                               |                                                                                   |                                                                                   | 74                                                                                |                                                                                   |                                                                                     | 1661                                                                                |                                                                                     |                                                                                     | 2033                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 59.0                                                                              |                                                                                   |                                                                                   | 51.5                                                                              |                                                                                   |                                                                                     | 1.7                                                                                 |                                                                                     |                                                                                     | 8.5                                                                                 |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 4.5                                                                               | 106.3                                                                             |                                                                                   | 24.2                                                                              | 4.2                                                                               | 106.6                                                                             |                                                                                     | 24.2                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 8.0                                                                               | 84.0                                                                              |                                                                                   | 29.0                                                                              | 8.0                                                                               | 84.0                                                                              |                                                                                     | 29.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.4                                                                               | 35.4                                                                              |                                                                                   | 7.2                                                                               | 2.2                                                                               | 2.0                                                                               |                                                                                     | 18.7                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 41.3                                                                              |                                                                                   | 0.2                                                                               | 0.0                                                                               | 50.7                                                                              |                                                                                     | 0.5                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 8.9                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 10: Honoapiilani Highway & Kapunakea Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |                                                                                     |  |  |                                                                                     |
| Traffic Volume (veh/h)       | 138                                                                               | 35                                                                                | 44                                                                                | 91                                                                                | 23                                                                                | 17                                                                                | 51                                                                                 | 1352                                                                                | 103                                                                                 | 23                                                                                  | 1596                                                                                | 136                                                                                 |
| Future Volume (veh/h)        | 138                                                                               | 35                                                                                | 44                                                                                | 91                                                                                | 23                                                                                | 17                                                                                | 51                                                                                 | 1352                                                                                | 103                                                                                 | 23                                                                                  | 1596                                                                                | 136                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.97                                                                              |                                                                                   | 0.97                                                                              | 0.98                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 150                                                                               | 38                                                                                | 5                                                                                 | 99                                                                                | 25                                                                                | 2                                                                                 | 55                                                                                 | 1470                                                                                | 109                                                                                 | 25                                                                                  | 1735                                                                                | 144                                                                                 |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 223                                                                               | 44                                                                                | 256                                                                               | 294                                                                               | 283                                                                               | 23                                                                                | 70                                                                                 | 2430                                                                                | 179                                                                                 | 31                                                                                  | 2335                                                                                | 191                                                                                 |
| Arrive On Green              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.16                                                                              | 0.08                                                                               | 1.00                                                                                | 1.00                                                                                | 0.02                                                                                | 0.71                                                                                | 0.70                                                                                |
| Sat Flow, veh/h              | 1049                                                                              | 266                                                                               | 1538                                                                              | 1343                                                                              | 1698                                                                              | 136                                                                               | 1774                                                                               | 3342                                                                                | 247                                                                                 | 1774                                                                                | 3312                                                                                | 272                                                                                 |
| Grp Volume(v), veh/h         | 188                                                                               | 0                                                                                 | 5                                                                                 | 99                                                                                | 0                                                                                 | 27                                                                                | 55                                                                                 | 775                                                                                 | 804                                                                                 | 25                                                                                  | 917                                                                                 | 962                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1315                                                                              | 0                                                                                 | 1538                                                                              | 1343                                                                              | 0                                                                                 | 1834                                                                              | 1774                                                                               | 1770                                                                                | 1819                                                                                | 1774                                                                                | 1770                                                                                | 1814                                                                                |
| Q Serve(g_s), s              | 17.4                                                                              | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 1.7                                                                               | 4.1                                                                                | 0.0                                                                                 | 0.0                                                                                 | 1.9                                                                                 | 42.8                                                                                | 45.0                                                                                |
| Cycle Q Clear(g_c), s        | 19.1                                                                              | 0.0                                                                               | 0.4                                                                               | 8.2                                                                               | 0.0                                                                               | 1.7                                                                               | 4.1                                                                                | 0.0                                                                                 | 0.0                                                                                 | 1.9                                                                                 | 42.8                                                                                | 45.0                                                                                |
| Prop In Lane                 | 0.80                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.07                                                                              | 1.00                                                                               |                                                                                     | 0.14                                                                                | 1.00                                                                                |                                                                                     | 0.15                                                                                |
| Lane Grp Cap(c), veh/h       | 267                                                                               | 0                                                                                 | 256                                                                               | 294                                                                               | 0                                                                                 | 305                                                                               | 70                                                                                 | 1287                                                                                | 1322                                                                                | 31                                                                                  | 1248                                                                                | 1279                                                                                |
| V/C Ratio(X)                 | 0.70                                                                              | 0.00                                                                              | 0.02                                                                              | 0.34                                                                              | 0.00                                                                              | 0.09                                                                              | 0.78                                                                               | 0.60                                                                                | 0.61                                                                                | 0.80                                                                                | 0.74                                                                                | 0.75                                                                                |
| Avail Cap(c_a), veh/h        | 336                                                                               | 0                                                                                 | 330                                                                               | 359                                                                               | 0                                                                                 | 394                                                                               | 105                                                                                | 1287                                                                                | 1322                                                                                | 105                                                                                 | 1248                                                                                | 1279                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 2.00                                                                               | 2.00                                                                                | 2.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.55                                                                               | 0.55                                                                                | 0.55                                                                                | 0.67                                                                                | 0.67                                                                                | 0.67                                                                                |
| Uniform Delay (d), s/veh     | 55.7                                                                              | 0.0                                                                               | 47.0                                                                              | 50.3                                                                              | 0.0                                                                               | 47.6                                                                              | 61.6                                                                               | 0.0                                                                                 | 0.0                                                                                 | 66.1                                                                                | 12.2                                                                                | 12.6                                                                                |
| Incr Delay (d2), s/veh       | 4.8                                                                               | 0.0                                                                               | 0.0                                                                               | 0.7                                                                               | 0.0                                                                               | 0.1                                                                               | 5.9                                                                                | 1.2                                                                                 | 1.2                                                                                 | 11.2                                                                                | 2.6                                                                                 | 2.8                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 7.2                                                                               | 0.0                                                                               | 0.2                                                                               | 3.4                                                                               | 0.0                                                                               | 0.9                                                                               | 2.1                                                                                | 0.4                                                                                 | 0.4                                                                                 | 1.0                                                                                 | 21.6                                                                                | 23.2                                                                                |
| LnGrp Delay(d),s/veh         | 60.5                                                                              | 0.0                                                                               | 47.1                                                                              | 51.0                                                                              | 0.0                                                                               | 47.7                                                                              | 67.5                                                                               | 1.2                                                                                 | 1.2                                                                                 | 77.3                                                                                | 14.8                                                                                | 15.4                                                                                |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 |                                                                                   | D                                                                                 | E                                                                                  | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 193                                                                               |                                                                                   |                                                                                   | 126                                                                               |                                                                                   |                                                                                    | 1634                                                                                |                                                                                     |                                                                                     | 1904                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 60.1                                                                              |                                                                                   |                                                                                   | 50.3                                                                              |                                                                                   |                                                                                    | 3.4                                                                                 |                                                                                     |                                                                                     | 15.9                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                    | A                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 9.3                                                                               | 99.2                                                                              |                                                                                   | 26.5                                                                              | 6.4                                                                               | 102.1                                                                             |                                                                                    | 26.5                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 8.0                                                                               | 85.0                                                                              |                                                                                   | 28.0                                                                              | 8.0                                                                               | 85.0                                                                              |                                                                                    | 28.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 6.1                                                                               | 47.0                                                                              |                                                                                   | 10.2                                                                              | 3.9                                                                               | 2.0                                                                               |                                                                                    | 21.1                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 28.7                                                                              |                                                                                   | 0.4                                                                               | 0.0                                                                               | 33.3                                                                              |                                                                                    | 0.4                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 14.0                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 11: Honoapiilani Highway & Keawe Street

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 54                                                                                | 160                                                                               | 80                                                                                | 162                                                                               | 85                                                                                | 420                                                                               | 76                                                                                  | 1048                                                                                | 254                                                                                 | 381                                                                                 | 1238                                                                                | 58                                                                                  |
| Future Volume (veh/h)        | 54                                                                                | 160                                                                               | 80                                                                                | 162                                                                               | 85                                                                                | 420                                                                               | 76                                                                                  | 1048                                                                                | 254                                                                                 | 381                                                                                 | 1238                                                                                | 58                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                                |                                                                                     | 0.99                                                                                | 1.00                                                                                |                                                                                     | 0.99                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 59                                                                                | 174                                                                               | 9                                                                                 | 176                                                                               | 92                                                                                | 153                                                                               | 83                                                                                  | 1139                                                                                | 197                                                                                 | 414                                                                                 | 1346                                                                                | 61                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 93                                                                                | 211                                                                               | 256                                                                               | 244                                                                               | 532                                                                               | 444                                                                               | 105                                                                                 | 1401                                                                                | 622                                                                                 | 407                                                                                 | 1953                                                                                | 88                                                                                  |
| Arrive On Green              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.09                                                                              | 0.29                                                                              | 0.29                                                                              | 0.06                                                                                | 0.40                                                                                | 0.40                                                                                | 0.46                                                                                | 1.00                                                                                | 1.00                                                                                |
| Sat Flow, veh/h              | 357                                                                               | 1261                                                                              | 1532                                                                              | 1774                                                                              | 1863                                                                              | 1553                                                                              | 1774                                                                                | 3539                                                                                | 1571                                                                                | 1774                                                                                | 3447                                                                                | 156                                                                                 |
| Grp Volume(v), veh/h         | 233                                                                               | 0                                                                                 | 9                                                                                 | 176                                                                               | 92                                                                                | 153                                                                               | 83                                                                                  | 1139                                                                                | 197                                                                                 | 414                                                                                 | 690                                                                                 | 717                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1618                                                                              | 0                                                                                 | 1532                                                                              | 1774                                                                              | 1863                                                                              | 1553                                                                              | 1774                                                                                | 1770                                                                                | 1571                                                                                | 1774                                                                                | 1770                                                                                | 1834                                                                                |
| Q Serve(g_s), s              | 16.3                                                                              | 0.0                                                                               | 0.7                                                                               | 10.8                                                                              | 5.0                                                                               | 10.5                                                                              | 6.2                                                                                 | 38.7                                                                                | 11.7                                                                                | 31.0                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Cycle Q Clear(g_c), s        | 18.8                                                                              | 0.0                                                                               | 0.7                                                                               | 10.8                                                                              | 5.0                                                                               | 10.5                                                                              | 6.2                                                                                 | 38.7                                                                                | 11.7                                                                                | 31.0                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Prop In Lane                 | 0.25                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 0.09                                                                                |
| Lane Grp Cap(c), veh/h       | 304                                                                               | 0                                                                                 | 256                                                                               | 244                                                                               | 532                                                                               | 444                                                                               | 105                                                                                 | 1401                                                                                | 622                                                                                 | 407                                                                                 | 1002                                                                                | 1039                                                                                |
| V/C Ratio(X)                 | 0.77                                                                              | 0.00                                                                              | 0.04                                                                              | 0.72                                                                              | 0.17                                                                              | 0.34                                                                              | 0.79                                                                                | 0.81                                                                                | 0.32                                                                                | 1.02                                                                                | 0.69                                                                                | 0.69                                                                                |
| Avail Cap(c_a), veh/h        | 332                                                                               | 0                                                                                 | 284                                                                               | 244                                                                               | 566                                                                               | 472                                                                               | 276                                                                                 | 1401                                                                                | 622                                                                                 | 407                                                                                 | 1002                                                                                | 1039                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.88                                                                                | 0.88                                                                                | 0.88                                                                                | 0.56                                                                                | 0.56                                                                                | 0.56                                                                                |
| Uniform Delay (d), s/veh     | 54.5                                                                              | 0.0                                                                               | 47.1                                                                              | 41.7                                                                              | 36.2                                                                              | 38.2                                                                              | 62.7                                                                                | 36.3                                                                                | 28.2                                                                                | 36.5                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Incr Delay (d2), s/veh       | 9.5                                                                               | 0.0                                                                               | 0.1                                                                               | 10.0                                                                              | 0.2                                                                               | 0.5                                                                               | 4.5                                                                                 | 4.7                                                                                 | 1.2                                                                                 | 37.6                                                                                | 2.2                                                                                 | 2.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 9.3                                                                               | 0.0                                                                               | 0.3                                                                               | 6.0                                                                               | 2.6                                                                               | 4.6                                                                               | 3.2                                                                                 | 19.7                                                                                | 5.3                                                                                 | 19.3                                                                                | 0.6                                                                                 | 0.6                                                                                 |
| LnGrp Delay(d),s/veh         | 64.0                                                                              | 0.0                                                                               | 47.2                                                                              | 51.7                                                                              | 36.4                                                                              | 38.7                                                                              | 67.2                                                                                | 41.0                                                                                | 29.3                                                                                | 74.1                                                                                | 2.2                                                                                 | 2.1                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 | D                                                                                 | D                                                                                 | E                                                                                   | D                                                                                   | C                                                                                   | F                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 242                                                                               |                                                                                   |                                                                                   | 421                                                                               |                                                                                   |                                                                                     | 1419                                                                                |                                                                                     |                                                                                     | 1821                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 63.4                                                                              |                                                                                   |                                                                                   | 43.6                                                                              |                                                                                   |                                                                                     | 40.9                                                                                |                                                                                     |                                                                                     | 18.5                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                     | D                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 12.0                                                                              | 80.5                                                                              | 16.0                                                                              | 26.6                                                                              | 35.0                                                                              | 57.4                                                                              |                                                                                     | 42.6                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 21.0                                                                              | 60.0                                                                              | 11.0                                                                              | 24.0                                                                              | 31.0                                                                              | 50.0                                                                              |                                                                                     | 40.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 8.2                                                                               | 2.0                                                                               | 12.8                                                                              | 20.8                                                                              | 33.0                                                                              | 40.7                                                                              |                                                                                     | 12.5                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.1                                                                               | 23.4                                                                              | 0.0                                                                               | 0.3                                                                               | 0.0                                                                               | 6.9                                                                               |                                                                                     | 1.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 32.1                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



---

## **APPENDIX C**

### **LEVEL OF SERVICE CALCULATIONS**

- Existing WE Peak
-

# HCM 2010 Signalized Intersection Summary

## 1: Napilihau Street

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|--|--|--|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |  |  |  |  |  |  |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 39                                                                                | 22                                                                                | 305                                                                               | 25                                                                                | 28                                                                                | 12                                                                                | 250                                                                                 | 276                                                                                 | 19                                                                                  | 10                                                                                  | 251                                                                                 | 87                                                                                  |  |  |  |  |  |  |
| Future Volume (veh/h)        | 39                                                                                | 22                                                                                | 305                                                                               | 25                                                                                | 28                                                                                | 12                                                                                | 250                                                                                 | 276                                                                                 | 19                                                                                  | 10                                                                                  | 251                                                                                 | 87                                                                                  |  |  |  |  |  |  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |  |  |  |  |  |  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |  |  |  |  |  |  |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.99                                                                              | 0.99                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |  |  |  |  |  |  |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |  |  |  |  |  |  |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |  |  |  |  |  |  |
| Adj Flow Rate, veh/h         | 42                                                                                | 24                                                                                | 30                                                                                | 27                                                                                | 30                                                                                | 6                                                                                 | 272                                                                                 | 300                                                                                 | 19                                                                                  | 11                                                                                  | 273                                                                                 | 29                                                                                  |  |  |  |  |  |  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 1                                                                                   | 0                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |  |  |  |  |  |  |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |  |  |  |  |  |  |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |  |  |  |  |  |  |
| Cap, veh/h                   | 243                                                                               | 101                                                                               | 194                                                                               | 189                                                                               | 123                                                                               | 19                                                                                | 360                                                                                 | 812                                                                                 | 51                                                                                  | 15                                                                                  | 511                                                                                 | 434                                                                                 |  |  |  |  |  |  |
| Arrive On Green              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.20                                                                                | 0.47                                                                                | 0.47                                                                                | 0.01                                                                                | 0.27                                                                                | 0.27                                                                                |  |  |  |  |  |  |
| Sat Flow, veh/h              | 777                                                                               | 812                                                                               | 1567                                                                              | 493                                                                               | 988                                                                               | 156                                                                               | 1774                                                                                | 1733                                                                                | 110                                                                                 | 1774                                                                                | 1863                                                                                | 1580                                                                                |  |  |  |  |  |  |
| Grp Volume(v), veh/h         | 66                                                                                | 0                                                                                 | 30                                                                                | 63                                                                                | 0                                                                                 | 0                                                                                 | 272                                                                                 | 0                                                                                   | 319                                                                                 | 11                                                                                  | 273                                                                                 | 29                                                                                  |  |  |  |  |  |  |
| Grp Sat Flow(s),veh/h/ln     | 1589                                                                              | 0                                                                                 | 1567                                                                              | 1637                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 0                                                                                   | 1843                                                                                | 1774                                                                                | 1863                                                                                | 1580                                                                                |  |  |  |  |  |  |
| Q Serve(g_s), s              | 0.1                                                                               | 0.0                                                                               | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 5.8                                                                                 | 0.0                                                                                 | 4.5                                                                                 | 0.2                                                                                 | 5.0                                                                                 | 0.5                                                                                 |  |  |  |  |  |  |
| Cycle Q Clear(g_c), s        | 1.3                                                                               | 0.0                                                                               | 0.7                                                                               | 1.3                                                                               | 0.0                                                                               | 0.0                                                                               | 5.8                                                                                 | 0.0                                                                                 | 4.5                                                                                 | 0.2                                                                                 | 5.0                                                                                 | 0.5                                                                                 |  |  |  |  |  |  |
| Prop In Lane                 | 0.64                                                                              |                                                                                   | 1.00                                                                              | 0.43                                                                              |                                                                                   | 0.10                                                                              | 1.00                                                                                |                                                                                     | 0.06                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |  |  |  |  |  |  |
| Lane Grp Cap(c), veh/h       | 344                                                                               | 0                                                                                 | 194                                                                               | 331                                                                               | 0                                                                                 | 0                                                                                 | 360                                                                                 | 0                                                                                   | 864                                                                                 | 15                                                                                  | 511                                                                                 | 434                                                                                 |  |  |  |  |  |  |
| V/C Ratio(X)                 | 0.19                                                                              | 0.00                                                                              | 0.15                                                                              | 0.19                                                                              | 0.00                                                                              | 0.00                                                                              | 0.76                                                                                | 0.00                                                                                | 0.37                                                                                | 0.72                                                                                | 0.53                                                                                | 0.07                                                                                |  |  |  |  |  |  |
| Avail Cap(c_a), veh/h        | 1056                                                                              | 0                                                                                 | 937                                                                               | 1073                                                                              | 0                                                                                 | 0                                                                                 | 1326                                                                                | 0                                                                                   | 3627                                                                                | 663                                                                                 | 2970                                                                                | 2520                                                                                |  |  |  |  |  |  |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |  |  |  |  |  |  |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                                | 0.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |  |  |  |  |  |  |
| Uniform Delay (d), s/veh     | 16.0                                                                              | 0.0                                                                               | 15.7                                                                              | 15.9                                                                              | 0.0                                                                               | 0.0                                                                               | 15.1                                                                                | 0.0                                                                                 | 6.9                                                                                 | 19.9                                                                                | 12.4                                                                                | 10.8                                                                                |  |  |  |  |  |  |
| Incr Delay (d2), s/veh       | 0.3                                                                               | 0.0                                                                               | 0.4                                                                               | 0.3                                                                               | 0.0                                                                               | 0.0                                                                               | 3.3                                                                                 | 0.0                                                                                 | 0.6                                                                                 | 47.3                                                                                | 1.8                                                                                 | 0.1                                                                                 |  |  |  |  |  |  |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |  |  |  |  |  |  |
| %ile BackOfQ(50%),veh/ln     | 0.7                                                                               | 0.0                                                                               | 0.3                                                                               | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 3.1                                                                                 | 0.0                                                                                 | 2.4                                                                                 | 0.3                                                                                 | 2.8                                                                                 | 0.3                                                                                 |  |  |  |  |  |  |
| LnGrp Delay(d),s/veh         | 16.2                                                                              | 0.0                                                                               | 16.1                                                                              | 16.2                                                                              | 0.0                                                                               | 0.0                                                                               | 18.3                                                                                | 0.0                                                                                 | 7.4                                                                                 | 67.1                                                                                | 14.2                                                                                | 10.9                                                                                |  |  |  |  |  |  |
| LnGrp LOS                    | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                 |                                                                                   |                                                                                   | B                                                                                   |                                                                                     | A                                                                                   | E                                                                                   | B                                                                                   | B                                                                                   |  |  |  |  |  |  |
| Approach Vol, veh/h          | 96                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 63                                                                                | 591                                                                                 |                                                                                     |                                                                                     | 313                                                                                 |                                                                                     |                                                                                     |  |  |  |  |  |  |
| Approach Delay, s/veh        | 16.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 16.2                                                                              | 12.4                                                                                |                                                                                     |                                                                                     | 15.8                                                                                |                                                                                     |                                                                                     |  |  |  |  |  |  |
| Approach LOS                 | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   | B                                                                                 | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |  |  |  |  |  |  |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 4                                                                                 |                                                                                   | 5                                                                                 | 6                                                                                 | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |
| Phs Duration (G+Y+Rc), s     | 5.3                                                                               | 24.8                                                                              | 10.0                                                                              |                                                                                   | 13.1                                                                              | 17.0                                                                              | 10.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 6.0                                                                               | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 79.0                                                                              | 24.0                                                                              |                                                                                   | 30.0                                                                              | 64.0                                                                              | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |
| Max Q Clear Time (g_c+I1), s | 2.2                                                                               | 6.5                                                                               | 3.3                                                                               |                                                                                   | 7.8                                                                               | 7.0                                                                               | 3.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |
| Green Ext Time (p_c), s      | 0.0                                                                               | 4.3                                                                               | 0.4                                                                               |                                                                                   | 0.8                                                                               | 3.8                                                                               | 0.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |
| HCM 2010 Ctrl Delay          | 14.0                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |
| HCM 2010 LOS                 | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |

## HCM 2010 Signalized Intersection Summary 2: Hoohui Road

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 52                                                                                | 16                                                                                | 176                                                                               | 35                                                                                | 15                                                                                | 5                                                                                 | 118                                                                                 | 375                                                                                 | 22                                                                                  | 12                                                                                  | 414                                                                                 | 55                                                                                  |
| Future Volume (veh/h)        | 52                                                                                | 16                                                                                | 176                                                                               | 35                                                                                | 15                                                                                | 5                                                                                 | 118                                                                                 | 375                                                                                 | 22                                                                                  | 12                                                                                  | 414                                                                                 | 55                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                              |                                                                                   | 0.98                                                                              | 0.99                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 57                                                                                | 17                                                                                | 21                                                                                | 38                                                                                | 16                                                                                | 1                                                                                 | 128                                                                                 | 408                                                                                 | 0                                                                                   | 13                                                                                  | 450                                                                                 | 22                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 322                                                                               | 75                                                                                | 239                                                                               | 340                                                                               | 265                                                                               | 17                                                                                | 456                                                                                 | 777                                                                                 | 660                                                                                 | 453                                                                                 | 654                                                                                 | 553                                                                                 |
| Arrive On Green              | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.08                                                                                | 0.42                                                                                | 0.00                                                                                | 0.01                                                                                | 0.35                                                                                | 0.35                                                                                |
| Sat Flow, veh/h              | 1010                                                                              | 489                                                                               | 1558                                                                              | 1346                                                                              | 1733                                                                              | 108                                                                               | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1577                                                                                |
| Grp Volume(v), veh/h         | 74                                                                                | 0                                                                                 | 21                                                                                | 38                                                                                | 0                                                                                 | 17                                                                                | 128                                                                                 | 408                                                                                 | 0                                                                                   | 13                                                                                  | 450                                                                                 | 22                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1498                                                                              | 0                                                                                 | 1558                                                                              | 1346                                                                              | 0                                                                                 | 1842                                                                              | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1577                                                                                |
| Q Serve(g_s), s              | 1.0                                                                               | 0.0                                                                               | 0.4                                                                               | 1.0                                                                               | 0.0                                                                               | 0.3                                                                               | 1.7                                                                                 | 6.2                                                                                 | 0.0                                                                                 | 0.2                                                                                 | 7.9                                                                                 | 0.4                                                                                 |
| Cycle Q Clear(g_c), s        | 1.6                                                                               | 0.0                                                                               | 0.4                                                                               | 2.5                                                                               | 0.0                                                                               | 0.3                                                                               | 1.7                                                                                 | 6.2                                                                                 | 0.0                                                                                 | 0.2                                                                                 | 7.9                                                                                 | 0.4                                                                                 |
| Prop In Lane                 | 0.77                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 397                                                                               | 0                                                                                 | 239                                                                               | 340                                                                               | 0                                                                                 | 282                                                                               | 456                                                                                 | 777                                                                                 | 660                                                                                 | 453                                                                                 | 654                                                                                 | 553                                                                                 |
| V/C Ratio(X)                 | 0.19                                                                              | 0.00                                                                              | 0.09                                                                              | 0.11                                                                              | 0.00                                                                              | 0.06                                                                              | 0.28                                                                                | 0.53                                                                                | 0.00                                                                                | 0.03                                                                                | 0.69                                                                                | 0.04                                                                                |
| Avail Cap(c_a), veh/h        | 1129                                                                              | 0                                                                                 | 1022                                                                              | 1017                                                                              | 0                                                                                 | 1208                                                                              | 1019                                                                                | 2492                                                                                | 2118                                                                                | 1133                                                                                | 2492                                                                                | 2109                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 0.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 14.3                                                                              | 0.0                                                                               | 13.9                                                                              | 15.5                                                                              | 0.0                                                                               | 13.8                                                                              | 7.7                                                                                 | 8.3                                                                                 | 0.0                                                                                 | 8.0                                                                                 | 10.6                                                                                | 8.1                                                                                 |
| Incr Delay (d2), s/veh       | 0.2                                                                               | 0.0                                                                               | 0.2                                                                               | 0.1                                                                               | 0.0                                                                               | 0.1                                                                               | 0.3                                                                                 | 0.6                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 1.3                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.7                                                                               | 0.0                                                                               | 0.2                                                                               | 0.4                                                                               | 0.0                                                                               | 0.2                                                                               | 0.8                                                                                 | 3.3                                                                                 | 0.0                                                                                 | 0.1                                                                                 | 4.2                                                                                 | 0.2                                                                                 |
| LnGrp Delay(d),s/veh         | 14.5                                                                              | 0.0                                                                               | 14.0                                                                              | 15.6                                                                              | 0.0                                                                               | 13.9                                                                              | 8.0                                                                                 | 8.8                                                                                 | 0.0                                                                                 | 8.0                                                                                 | 11.9                                                                                | 8.2                                                                                 |
| LnGrp LOS                    | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                 |                                                                                   | B                                                                                 | A                                                                                   | A                                                                                   |                                                                                     | A                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 95                                                                                |                                                                                   |                                                                                   | 55                                                                                |                                                                                   |                                                                                     | 536                                                                                 |                                                                                     |                                                                                     | 485                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 14.4                                                                              |                                                                                   |                                                                                   | 15.1                                                                              |                                                                                   |                                                                                     | 8.6                                                                                 |                                                                                     |                                                                                     | 11.6                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.4                                                                               | 21.9                                                                              |                                                                                   | 10.8                                                                              | 7.9                                                                               | 19.4                                                                              |                                                                                     | 10.8                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 51.0                                                                              |                                                                                   | 25.0                                                                              | 15.0                                                                              | 51.0                                                                              |                                                                                     | 25.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.2                                                                               | 8.2                                                                               |                                                                                   | 3.6                                                                               | 3.7                                                                               | 9.9                                                                               |                                                                                     | 4.5                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 2.7                                                                               |                                                                                   | 0.4                                                                               | 0.2                                                                               | 3.1                                                                               |                                                                                     | 0.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 10.6                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 3: Honoapiilani Highway & Akahele Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 37                                                                                | 5                                                                                 | 74                                                                                | 10                                                                                | 2                                                                                 | 10                                                                                | 70                                                                                 | 462                                                                                 | 11                                                                                  | 4                                                                                   | 581                                                                                 | 45                                                                                  |
| Future Volume (veh/h)        | 37                                                                                | 5                                                                                 | 74                                                                                | 10                                                                                | 2                                                                                 | 10                                                                                | 70                                                                                 | 462                                                                                 | 11                                                                                  | 4                                                                                   | 581                                                                                 | 45                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                  | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 40                                                                                | 5                                                                                 | 5                                                                                 | 11                                                                                | 2                                                                                 | 1                                                                                 | 76                                                                                 | 502                                                                                 | 7                                                                                   | 4                                                                                   | 632                                                                                 | 23                                                                                  |
| Adj No. of Lanes             | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 60                                                                                | 93                                                                                | 93                                                                                | 20                                                                                | 162                                                                               | 138                                                                               | 99                                                                                 | 897                                                                                 | 762                                                                                 | 6                                                                                   | 799                                                                                 | 678                                                                                 |
| Arrive On Green              | 0.03                                                                              | 0.11                                                                              | 0.11                                                                              | 0.01                                                                              | 0.09                                                                              | 0.09                                                                              | 0.06                                                                               | 0.48                                                                                | 0.48                                                                                | 0.00                                                                                | 0.43                                                                                | 0.43                                                                                |
| Sat Flow, veh/h              | 1774                                                                              | 852                                                                               | 852                                                                               | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1581                                                                                |
| Grp Volume(v), veh/h         | 40                                                                                | 0                                                                                 | 10                                                                                | 11                                                                                | 2                                                                                 | 1                                                                                 | 76                                                                                 | 502                                                                                 | 7                                                                                   | 4                                                                                   | 632                                                                                 | 23                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1774                                                                              | 0                                                                                 | 1705                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1581                                                                                |
| Q Serve(g_s), s              | 1.1                                                                               | 0.0                                                                               | 0.3                                                                               | 0.3                                                                               | 0.0                                                                               | 0.0                                                                               | 2.1                                                                                | 9.7                                                                                 | 0.1                                                                                 | 0.1                                                                                 | 14.9                                                                                | 0.4                                                                                 |
| Cycle Q Clear(g_c), s        | 1.1                                                                               | 0.0                                                                               | 0.3                                                                               | 0.3                                                                               | 0.0                                                                               | 0.0                                                                               | 2.1                                                                                | 9.7                                                                                 | 0.1                                                                                 | 0.1                                                                                 | 14.9                                                                                | 0.4                                                                                 |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 0.50                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 60                                                                                | 0                                                                                 | 187                                                                               | 20                                                                                | 162                                                                               | 138                                                                               | 99                                                                                 | 897                                                                                 | 762                                                                                 | 6                                                                                   | 799                                                                                 | 678                                                                                 |
| V/C Ratio(X)                 | 0.66                                                                              | 0.00                                                                              | 0.05                                                                              | 0.55                                                                              | 0.01                                                                              | 0.01                                                                              | 0.77                                                                               | 0.56                                                                                | 0.01                                                                                | 0.70                                                                                | 0.79                                                                                | 0.03                                                                                |
| Avail Cap(c_a), veh/h        | 700                                                                               | 0                                                                                 | 706                                                                               | 700                                                                               | 772                                                                               | 656                                                                               | 875                                                                                | 2388                                                                                | 2030                                                                                | 875                                                                                 | 2388                                                                                | 2028                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 24.2                                                                              | 0.0                                                                               | 20.2                                                                              | 24.9                                                                              | 21.2                                                                              | 21.1                                                                              | 23.6                                                                               | 9.3                                                                                 | 6.8                                                                                 | 25.2                                                                                | 12.5                                                                                | 8.4                                                                                 |
| Incr Delay (d2), s/veh       | 11.8                                                                              | 0.0                                                                               | 0.1                                                                               | 21.2                                                                              | 0.0                                                                               | 0.0                                                                               | 11.8                                                                               | 0.6                                                                                 | 0.0                                                                                 | 92.3                                                                                | 1.8                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.7                                                                               | 0.0                                                                               | 0.1                                                                               | 0.3                                                                               | 0.0                                                                               | 0.0                                                                               | 1.4                                                                                | 5.0                                                                                 | 0.1                                                                                 | 0.2                                                                                 | 7.9                                                                                 | 0.2                                                                                 |
| LnGrp Delay(d),s/veh         | 36.0                                                                              | 0.0                                                                               | 20.3                                                                              | 46.2                                                                              | 21.2                                                                              | 21.2                                                                              | 35.4                                                                               | 9.9                                                                                 | 6.9                                                                                 | 117.6                                                                               | 14.3                                                                                | 8.4                                                                                 |
| LnGrp LOS                    | D                                                                                 |                                                                                   | C                                                                                 | D                                                                                 | C                                                                                 | C                                                                                 | D                                                                                  | A                                                                                   | A                                                                                   | F                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 50                                                                                |                                                                                   |                                                                                   | 14                                                                                |                                                                                   |                                                                                   | 585                                                                                |                                                                                     |                                                                                     | 659                                                                                 |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 32.9                                                                              |                                                                                   |                                                                                   | 40.8                                                                              |                                                                                   |                                                                                   | 13.2                                                                               |                                                                                     |                                                                                     | 14.7                                                                                |                                                                                     |                                                                                     |
| Approach LOS                 | C                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | B                                                                                  |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.2                                                                               | 29.4                                                                              | 5.6                                                                               | 10.6                                                                              | 7.8                                                                               | 26.7                                                                              | 6.7                                                                                | 9.4                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              | 25.0                                                                              | 65.0                                                                              | 20.0                                                                               | 21.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.1                                                                               | 11.7                                                                              | 2.3                                                                               | 2.3                                                                               | 4.1                                                                               | 16.9                                                                              | 3.1                                                                                | 2.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 3.5                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                               | 4.9                                                                               | 0.1                                                                                | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          | 15.0                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 4: Honoapiilani Highway & Lower Honoapiilani Road

08/09/2017

|                              |  |      |      |      |      |      |      |      |      |      |      |      |
|------------------------------|------------------------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Movement                     | EBL                                                                                | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations          |                                                                                    | ↩    | ↪    |      | ↩↪   |      | ↩    | ↩↪   |      | ↩    | ↩↪   | ↪    |
| Traffic Volume (veh/h)       | 48                                                                                 | 9    | 536  | 9    | 0    | 1    | 356  | 501  | 5    | 0    | 632  | 47   |
| Future Volume (veh/h)        | 48                                                                                 | 9    | 536  | 9    | 0    | 1    | 356  | 501  | 5    | 0    | 632  | 47   |
| Number                       | 3                                                                                  | 8    | 18   | 7    | 4    | 14   | 1    | 6    | 16   | 5    | 2    | 12   |
| Initial Q (Qb), veh          | 0                                                                                  | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                               |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Parking Bus, Adj             | 1.00                                                                               | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln       | 1900                                                                               | 1863 | 1863 | 1900 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h         | 52                                                                                 | 10   | 0    | 10   | 0    | 1    | 387  | 545  | 5    | 0    | 687  | 15   |
| Adj No. of Lanes             | 0                                                                                  | 1    | 1    | 0    | 1    | 0    | 1    | 2    | 0    | 1    | 2    | 1    |
| Peak Hour Factor             | 0.92                                                                               | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, %         | 2                                                                                  | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |
| Cap, veh/h                   | 215                                                                                | 15   | 102  | 228  | 5    | 9    | 467  | 2557 | 23   | 4    | 1298 | 578  |
| Arrive On Green              | 0.08                                                                               | 0.06 | 0.00 | 0.08 | 0.00 | 0.06 | 0.26 | 0.71 | 0.71 | 0.00 | 0.37 | 0.37 |
| Sat Flow, veh/h              | 1245                                                                               | 239  | 1583 | 1363 | 80   | 144  | 1774 | 3594 | 33   | 1774 | 3539 | 1577 |
| Grp Volume(v), veh/h         | 62                                                                                 | 0    | 0    | 11   | 0    | 0    | 387  | 268  | 282  | 0    | 687  | 15   |
| Grp Sat Flow(s),veh/h/ln     | 1485                                                                               | 0    | 1583 | 1587 | 0    | 0    | 1774 | 1770 | 1857 | 1774 | 1770 | 1577 |
| Q Serve(g_s), s              | 1.7                                                                                | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 10.1 | 2.5  | 2.5  | 0.0  | 7.5  | 0.3  |
| Cycle Q Clear(g_c), s        | 1.9                                                                                | 0.0  | 0.0  | 0.3  | 0.0  | 0.0  | 10.1 | 2.5  | 2.5  | 0.0  | 7.5  | 0.3  |
| Prop In Lane                 | 0.84                                                                               |      | 1.00 | 0.91 |      | 0.09 | 1.00 |      | 0.02 | 1.00 |      | 1.00 |
| Lane Grp Cap(c), veh/h       | 261                                                                                | 0    | 102  | 274  | 0    | 0    | 467  | 1259 | 1321 | 4    | 1298 | 578  |
| V/C Ratio(X)                 | 0.24                                                                               | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.83 | 0.21 | 0.21 | 0.00 | 0.53 | 0.03 |
| Avail Cap(c_a), veh/h        | 764                                                                                | 0    | 646  | 904  | 0    | 0    | 2569 | 2490 | 2613 | 2569 | 4980 | 2219 |
| HCM Platoon Ratio            | 1.00                                                                               | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I)           | 1.00                                                                               | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh     | 21.9                                                                               | 0.0  | 0.0  | 21.2 | 0.0  | 0.0  | 17.0 | 2.4  | 2.4  | 0.0  | 12.2 | 9.9  |
| Incr Delay (d2), s/veh       | 0.5                                                                                | 0.0  | 0.0  | 0.1  | 0.0  | 0.0  | 1.5  | 0.2  | 0.2  | 0.0  | 0.7  | 0.0  |
| Initial Q Delay(d3),s/veh    | 0.0                                                                                | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln     | 0.8                                                                                | 0.0  | 0.0  | 0.1  | 0.0  | 0.0  | 5.1  | 1.3  | 1.3  | 0.0  | 3.8  | 0.1  |
| LnGrp Delay(d),s/veh         | 22.4                                                                               | 0.0  | 0.0  | 21.2 | 0.0  | 0.0  | 18.5 | 2.6  | 2.6  | 0.0  | 12.9 | 10.0 |
| LnGrp LOS                    | C                                                                                  |      |      | C    |      |      | B    | A    | A    |      | B    | A    |
| Approach Vol, veh/h          |                                                                                    | 62   |      |      | 11   |      |      | 937  |      |      | 702  |      |
| Approach Delay, s/veh        |                                                                                    | 22.4 |      |      | 21.2 |      |      | 9.2  |      |      | 12.9 |      |
| Approach LOS                 |                                                                                    | C    |      |      | C    |      |      | A    |      |      | B    |      |
| Timer                        | 1                                                                                  | 2    | 3    | 4    | 5    | 6    | 7    | 8    |      |      |      |      |
| Assigned Phs                 | 1                                                                                  | 2    |      | 4    | 5    | 6    |      | 8    |      |      |      |      |
| Phs Duration (G+Y+Rc), s     | 16.9                                                                               | 24.0 |      | 8.2  | 0.0  | 40.9 |      | 8.2  |      |      |      |      |
| Change Period (Y+Rc), s      | 4.0                                                                                | 6.0  |      | 5.0  | 4.0  | 6.0  |      | 5.0  |      |      |      |      |
| Max Green Setting (Gmax), s  | 71.0                                                                               | 69.0 |      | 25.0 | 71.0 | 69.0 |      | 20.0 |      |      |      |      |
| Max Q Clear Time (g_c+I1), s | 12.1                                                                               | 9.5  |      | 2.3  | 0.0  | 4.5  |      | 3.9  |      |      |      |      |
| Green Ext Time (p_c), s      | 0.9                                                                                | 8.5  |      | 0.0  | 0.0  | 5.6  |      | 0.1  |      |      |      |      |
| <b>Intersection Summary</b>  |                                                                                    |      |      |      |      |      |      |      |      |      |      |      |
| HCM 2010 Ctrl Delay          |                                                                                    |      | 11.2 |      |      |      |      |      |      |      |      |      |
| HCM 2010 LOS                 |                                                                                    |      | B    |      |      |      |      |      |      |      |      |      |

# HCM 2010 Signalized Intersection Summary

## 5: Honoapiilani Highway & Halawai Drive

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 26                                                                                | 2                                                                                 | 66                                                                                | 14                                                                                | 2                                                                                 | 12                                                                                | 43                                                                                  | 826                                                                                 | 15                                                                                  | 9                                                                                   | 1141                                                                                | 39                                                                                  |
| Future Volume (veh/h)        | 26                                                                                | 2                                                                                 | 66                                                                                | 14                                                                                | 2                                                                                 | 12                                                                                | 43                                                                                  | 826                                                                                 | 15                                                                                  | 9                                                                                   | 1141                                                                                | 39                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                              |                                                                                   | 0.98                                                                              | 0.98                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 28                                                                                | 2                                                                                 | 1                                                                                 | 15                                                                                | 2                                                                                 | 1                                                                                 | 47                                                                                  | 898                                                                                 | 15                                                                                  | 10                                                                                  | 1240                                                                                | 26                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 240                                                                               | 12                                                                                | 131                                                                               | 207                                                                               | 22                                                                                | 6                                                                                 | 57                                                                                  | 2315                                                                                | 39                                                                                  | 14                                                                                  | 2213                                                                                | 988                                                                                 |
| Arrive On Green              | 0.10                                                                              | 0.08                                                                              | 0.08                                                                              | 0.10                                                                              | 0.08                                                                              | 0.08                                                                              | 0.03                                                                                | 0.65                                                                                | 0.65                                                                                | 0.01                                                                                | 0.63                                                                                | 0.63                                                                                |
| Sat Flow, veh/h              | 1325                                                                              | 142                                                                               | 1547                                                                              | 1013                                                                              | 259                                                                               | 75                                                                                | 1774                                                                                | 3562                                                                                | 60                                                                                  | 1774                                                                                | 3539                                                                                | 1580                                                                                |
| Grp Volume(v), veh/h         | 30                                                                                | 0                                                                                 | 1                                                                                 | 18                                                                                | 0                                                                                 | 0                                                                                 | 47                                                                                  | 446                                                                                 | 467                                                                                 | 10                                                                                  | 1240                                                                                | 26                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1468                                                                              | 0                                                                                 | 1547                                                                              | 1347                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1852                                                                                | 1774                                                                                | 1770                                                                                | 1580                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 1.4                                                                                 | 6.4                                                                                 | 6.4                                                                                 | 0.3                                                                                 | 11.0                                                                                | 0.3                                                                                 |
| Cycle Q Clear(g_c), s        | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 1.0                                                                               | 0.0                                                                               | 0.0                                                                               | 1.4                                                                                 | 6.4                                                                                 | 6.4                                                                                 | 0.3                                                                                 | 11.0                                                                                | 0.3                                                                                 |
| Prop In Lane                 | 0.93                                                                              |                                                                                   | 1.00                                                                              | 0.83                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                                |                                                                                     | 0.03                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 279                                                                               | 0                                                                                 | 131                                                                               | 260                                                                               | 0                                                                                 | 0                                                                                 | 57                                                                                  | 1150                                                                                | 1204                                                                                | 14                                                                                  | 2213                                                                                | 988                                                                                 |
| V/C Ratio(X)                 | 0.11                                                                              | 0.00                                                                              | 0.01                                                                              | 0.07                                                                              | 0.00                                                                              | 0.00                                                                              | 0.82                                                                                | 0.39                                                                                | 0.39                                                                                | 0.73                                                                                | 0.56                                                                                | 0.03                                                                                |
| Avail Cap(c_a), veh/h        | 756                                                                               | 0                                                                                 | 656                                                                               | 746                                                                               | 0                                                                                 | 0                                                                                 | 686                                                                                 | 2804                                                                                | 2934                                                                                | 359                                                                                 | 4955                                                                                | 2211                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 22.7                                                                              | 0.0                                                                               | 22.8                                                                              | 22.7                                                                              | 0.0                                                                               | 0.0                                                                               | 26.1                                                                                | 4.5                                                                                 | 4.5                                                                                 | 26.9                                                                                | 5.9                                                                                 | 3.9                                                                                 |
| Incr Delay (d2), s/veh       | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 10.2                                                                                | 0.5                                                                                 | 0.4                                                                                 | 23.6                                                                                | 0.5                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 0.9                                                                                 | 3.2                                                                                 | 3.4                                                                                 | 0.2                                                                                 | 5.3                                                                                 | 0.2                                                                                 |
| LnGrp Delay(d),s/veh         | 22.8                                                                              | 0.0                                                                               | 22.8                                                                              | 22.7                                                                              | 0.0                                                                               | 0.0                                                                               | 36.3                                                                                | 4.9                                                                                 | 4.9                                                                                 | 50.5                                                                                | 6.3                                                                                 | 3.9                                                                                 |
| LnGrp LOS                    | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                 |                                                                                   |                                                                                   | D                                                                                   | A                                                                                   | A                                                                                   | D                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 31                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 18                                                                                | 960                                                                                 |                                                                                     |                                                                                     | 1276                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 22.8                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 22.7                                                                              | 6.4                                                                                 |                                                                                     |                                                                                     | 6.6                                                                                 |                                                                                     |                                                                                     |
| Approach LOS                 | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   | C                                                                                 | A                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 4                                                                                 |                                                                                   | 5                                                                                 | 6                                                                                 | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.8                                                                               | 38.9                                                                              | 9.6                                                                               |                                                                                   | 4.4                                                                               | 40.3                                                                              | 9.6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   | 4.0                                                                               | 5.0                                                                               | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 21.0                                                                              | 76.0                                                                              | 23.0                                                                              |                                                                                   | 11.0                                                                              | 86.0                                                                              | 23.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 3.4                                                                               | 13.0                                                                              | 3.0                                                                               |                                                                                   | 2.3                                                                               | 8.4                                                                               | 2.8                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 21.0                                                                              | 0.0                                                                               |                                                                                   | 0.0                                                                               | 11.4                                                                              | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 6.9                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

HCM 2010 Signalized Intersection Summary  
6: Honoapiilani Highway & Kai Ala Drive/Puukolii Road

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 48                                                                                | 2                                                                                 | 167                                                                               | 38                                                                                | 3                                                                                 | 27                                                                                | 101                                                                                | 782                                                                                 | 45                                                                                  | 27                                                                                  | 1114                                                                                | 63                                                                                  |
| Future Volume (veh/h)        | 48                                                                                | 2                                                                                 | 167                                                                               | 38                                                                                | 3                                                                                 | 27                                                                                | 101                                                                                | 782                                                                                 | 45                                                                                  | 27                                                                                  | 1114                                                                                | 63                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 52                                                                                | 2                                                                                 | 17                                                                                | 41                                                                                | 3                                                                                 | 3                                                                                 | 110                                                                                | 850                                                                                 | 28                                                                                  | 29                                                                                  | 1211                                                                                | 34                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 2                                                                                   | 1                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 325                                                                               | 10                                                                                | 260                                                                               | 287                                                                               | 141                                                                               | 141                                                                               | 144                                                                                | 2064                                                                                | 923                                                                                 | 55                                                                                  | 1887                                                                                | 844                                                                                 |
| Arrive On Green              | 0.18                                                                              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.08                                                                               | 0.58                                                                                | 0.58                                                                                | 0.03                                                                                | 0.53                                                                                | 0.53                                                                                |
| Sat Flow, veh/h              | 1338                                                                              | 63                                                                                | 1578                                                                              | 1383                                                                              | 854                                                                               | 854                                                                               | 1774                                                                               | 3539                                                                                | 1583                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 54                                                                                | 0                                                                                 | 17                                                                                | 41                                                                                | 0                                                                                 | 6                                                                                 | 110                                                                                | 850                                                                                 | 28                                                                                  | 29                                                                                  | 1211                                                                                | 34                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1401                                                                              | 0                                                                                 | 1578                                                                              | 1383                                                                              | 0                                                                                 | 1709                                                                              | 1774                                                                               | 1770                                                                                | 1583                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 2.1                                                                               | 0.0                                                                               | 0.6                                                                               | 1.8                                                                               | 0.0                                                                               | 0.2                                                                               | 4.1                                                                                | 8.9                                                                                 | 0.5                                                                                 | 1.1                                                                                 | 16.5                                                                                | 0.7                                                                                 |
| Cycle Q Clear(g_c), s        | 2.3                                                                               | 0.0                                                                               | 0.6                                                                               | 4.1                                                                               | 0.0                                                                               | 0.2                                                                               | 4.1                                                                                | 8.9                                                                                 | 0.5                                                                                 | 1.1                                                                                 | 16.5                                                                                | 0.7                                                                                 |
| Prop In Lane                 | 0.96                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.50                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 356                                                                               | 0                                                                                 | 260                                                                               | 287                                                                               | 0                                                                                 | 282                                                                               | 144                                                                                | 2064                                                                                | 923                                                                                 | 55                                                                                  | 1887                                                                                | 844                                                                                 |
| V/C Ratio(X)                 | 0.15                                                                              | 0.00                                                                              | 0.07                                                                              | 0.14                                                                              | 0.00                                                                              | 0.02                                                                              | 0.77                                                                               | 0.41                                                                                | 0.03                                                                                | 0.53                                                                                | 0.64                                                                                | 0.04                                                                                |
| Avail Cap(c_a), veh/h        | 622                                                                               | 0                                                                                 | 557                                                                               | 548                                                                               | 0                                                                                 | 604                                                                               | 548                                                                                | 3595                                                                                | 1608                                                                                | 313                                                                                 | 3126                                                                                | 1399                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 24.3                                                                              | 0.0                                                                               | 23.9                                                                              | 26.4                                                                              | 0.0                                                                               | 23.8                                                                              | 30.6                                                                               | 7.8                                                                                 | 6.0                                                                                 | 32.4                                                                                | 11.2                                                                                | 7.6                                                                                 |
| Incr Delay (d2), s/veh       | 0.2                                                                               | 0.0                                                                               | 0.1                                                                               | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 3.2                                                                                | 0.3                                                                                 | 0.0                                                                                 | 2.9                                                                                 | 0.8                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.9                                                                               | 0.0                                                                               | 0.3                                                                               | 0.7                                                                               | 0.0                                                                               | 0.1                                                                               | 2.1                                                                                | 4.4                                                                                 | 0.2                                                                                 | 0.6                                                                                 | 8.1                                                                                 | 0.3                                                                                 |
| LnGrp Delay(d),s/veh         | 24.5                                                                              | 0.0                                                                               | 24.0                                                                              | 26.7                                                                              | 0.0                                                                               | 23.8                                                                              | 33.8                                                                               | 8.0                                                                                 | 6.0                                                                                 | 35.3                                                                                | 12.0                                                                                | 7.6                                                                                 |
| LnGrp LOS                    | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                  | A                                                                                   | A                                                                                   | D                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 71                                                                                |                                                                                   |                                                                                   | 47                                                                                |                                                                                   |                                                                                    | 988                                                                                 |                                                                                     |                                                                                     | 1274                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 24.4                                                                              |                                                                                   |                                                                                   | 26.3                                                                              |                                                                                   |                                                                                    | 10.9                                                                                |                                                                                     |                                                                                     | 12.4                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 9.5                                                                               | 42.2                                                                              |                                                                                   | 16.2                                                                              | 6.1                                                                               | 45.6                                                                              |                                                                                    | 16.2                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 21.0                                                                              | 60.0                                                                              |                                                                                   | 24.0                                                                              | 12.0                                                                              | 69.0                                                                              |                                                                                    | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 6.1                                                                               | 18.5                                                                              |                                                                                   | 6.1                                                                               | 3.1                                                                               | 10.9                                                                              |                                                                                    | 4.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.2                                                                               | 17.7                                                                              |                                                                                   | 0.1                                                                               | 0.0                                                                               | 11.5                                                                              |                                                                                    | 0.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 12.4                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 7: Honoapiilani Highway & Kaanapali Parkway/Halelo Street

08/09/2017

|                              |  |  |                                                                                    |  |  |  |                                                                                      |                                                                                      |  |  |                                                                                      |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                                                                                                                 | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                                                                                                    | NBT                                                                                                                                                                     | NBR                                                                                 | SBL                                                                                 | SBT                                                                                                                                                                     | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |   |                                                                                   |  |                                                                                   |   |   |                                                                                     |  |   |  |
| Traffic Volume (veh/h)       | 204                                                                               | 1                                                                                 | 432                                                                                                                                                                 | 12                                                                                | 3                                                                                 | 15                                                                                | 280                                                                                                                                                                    | 908                                                                                                                                                                     | 12                                                                                  | 25                                                                                  | 1141                                                                                                                                                                    | 136                                                                                 |
| Future Volume (veh/h)        | 204                                                                               | 1                                                                                 | 432                                                                                                                                                                 | 12                                                                                | 3                                                                                 | 15                                                                                | 280                                                                                                                                                                    | 908                                                                                                                                                                     | 12                                                                                  | 25                                                                                  | 1141                                                                                                                                                                    | 136                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                                                                                                  | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                                                                                                      | 6                                                                                                                                                                       | 16                                                                                  | 5                                                                                   | 2                                                                                                                                                                       | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                                                                                                   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                                                                                                      | 0                                                                                                                                                                       | 0                                                                                   | 0                                                                                   | 0                                                                                                                                                                       | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                                                                                                                | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                                                                                                   |                                                                                                                                                                         | 1.00                                                                                | 1.00                                                                                |                                                                                                                                                                         | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                                                                                                | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                                                                                                   | 1.00                                                                                                                                                                    | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                                                                                                    | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                                                                                                                | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                                                                                                   | 1863                                                                                                                                                                    | 1900                                                                                | 1863                                                                                | 1863                                                                                                                                                                    | 1863                                                                                |
| Adj Flow Rate, veh/h         | 222                                                                               | 1                                                                                 | 255                                                                                                                                                                 | 13                                                                                | 3                                                                                 | 4                                                                                 | 304                                                                                                                                                                    | 987                                                                                                                                                                     | 13                                                                                  | 27                                                                                  | 1240                                                                                                                                                                    | 107                                                                                 |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 2                                                                                                                                                                   | 0                                                                                 | 1                                                                                 | 0                                                                                 | 2                                                                                                                                                                      | 2                                                                                                                                                                       | 0                                                                                   | 1                                                                                   | 2                                                                                                                                                                       | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                                                                                                | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                                                                                                   | 0.92                                                                                                                                                                    | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                                                                                                    | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                                                                                                   | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                                                                                                      | 2                                                                                                                                                                       | 2                                                                                   | 2                                                                                   | 2                                                                                                                                                                       | 2                                                                                   |
| Cap, veh/h                   | 321                                                                               | 1                                                                                 | 846                                                                                                                                                                 | 58                                                                                | 13                                                                                | 18                                                                                | 454                                                                                                                                                                    | 1926                                                                                                                                                                    | 25                                                                                  | 124                                                                                 | 1685                                                                                                                                                                    | 753                                                                                 |
| Arrive On Green              | 0.18                                                                              | 0.18                                                                              | 0.17                                                                                                                                                                | 0.05                                                                              | 0.05                                                                              | 0.02                                                                              | 0.13                                                                                                                                                                   | 0.54                                                                                                                                                                    | 0.52                                                                                | 0.07                                                                                | 0.48                                                                                                                                                                    | 0.48                                                                                |
| Sat Flow, veh/h              | 1766                                                                              | 8                                                                                 | 2787                                                                                                                                                                | 1134                                                                              | 262                                                                               | 349                                                                               | 3442                                                                                                                                                                   | 3577                                                                                                                                                                    | 47                                                                                  | 1774                                                                                | 3539                                                                                                                                                                    | 1582                                                                                |
| Grp Volume(v), veh/h         | 223                                                                               | 0                                                                                 | 255                                                                                                                                                                 | 20                                                                                | 0                                                                                 | 0                                                                                 | 304                                                                                                                                                                    | 488                                                                                                                                                                     | 512                                                                                 | 27                                                                                  | 1240                                                                                                                                                                    | 107                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1774                                                                              | 0                                                                                 | 1393                                                                                                                                                                | 1744                                                                              | 0                                                                                 | 0                                                                                 | 1721                                                                                                                                                                   | 1770                                                                                                                                                                    | 1854                                                                                | 1774                                                                                | 1770                                                                                                                                                                    | 1582                                                                                |
| Q Serve(g_s), s              | 11.8                                                                              | 0.0                                                                               | 7.0                                                                                                                                                                 | 1.1                                                                               | 0.0                                                                               | 0.0                                                                               | 8.5                                                                                                                                                                    | 17.7                                                                                                                                                                    | 17.7                                                                                | 1.4                                                                                 | 28.4                                                                                                                                                                    | 3.8                                                                                 |
| Cycle Q Clear(g_c), s        | 11.8                                                                              | 0.0                                                                               | 7.0                                                                                                                                                                 | 1.1                                                                               | 0.0                                                                               | 0.0                                                                               | 8.5                                                                                                                                                                    | 17.7                                                                                                                                                                    | 17.7                                                                                | 1.4                                                                                 | 28.4                                                                                                                                                                    | 3.8                                                                                 |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 1.00                                                                                                                                                                | 0.65                                                                              |                                                                                   | 0.20                                                                              | 1.00                                                                                                                                                                   |                                                                                                                                                                         | 0.03                                                                                | 1.00                                                                                |                                                                                                                                                                         | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 322                                                                               | 0                                                                                 | 846                                                                                                                                                                 | 89                                                                                | 0                                                                                 | 0                                                                                 | 454                                                                                                                                                                    | 953                                                                                                                                                                     | 999                                                                                 | 124                                                                                 | 1685                                                                                                                                                                    | 753                                                                                 |
| V/C Ratio(X)                 | 0.69                                                                              | 0.00                                                                              | 0.30                                                                                                                                                                | 0.22                                                                              | 0.00                                                                              | 0.00                                                                              | 0.67                                                                                                                                                                   | 0.51                                                                                                                                                                    | 0.51                                                                                | 0.22                                                                                | 0.74                                                                                                                                                                    | 0.14                                                                                |
| Avail Cap(c_a), veh/h        | 989                                                                               | 0                                                                                 | 1893                                                                                                                                                                | 608                                                                               | 0                                                                                 | 0                                                                                 | 1473                                                                                                                                                                   | 3681                                                                                                                                                                    | 3857                                                                                | 371                                                                                 | 6587                                                                                                                                                                    | 2945                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                                                                                                | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                                                                                                   | 1.00                                                                                                                                                                    | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                                                                                                    | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                                                                                                                | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                                                                                                                   | 1.00                                                                                                                                                                    | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                                                                                                    | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 38.5                                                                              | 0.0                                                                               | 26.8                                                                                                                                                                | 46.0                                                                              | 0.0                                                                               | 0.0                                                                               | 41.5                                                                                                                                                                   | 14.8                                                                                                                                                                    | 14.8                                                                                | 44.2                                                                                | 21.2                                                                                                                                                                    | 14.8                                                                                |
| Incr Delay (d2), s/veh       | 1.0                                                                               | 0.0                                                                               | 0.1                                                                                                                                                                 | 0.5                                                                               | 0.0                                                                               | 0.0                                                                               | 0.6                                                                                                                                                                    | 0.6                                                                                                                                                                     | 0.6                                                                                 | 0.3                                                                                 | 0.9                                                                                                                                                                     | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                                                                                                 | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                                                                                                    | 0.0                                                                                                                                                                     | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                                                                                                     | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 5.9                                                                               | 0.0                                                                               | 2.7                                                                                                                                                                 | 0.5                                                                               | 0.0                                                                               | 0.0                                                                               | 4.1                                                                                                                                                                    | 8.7                                                                                                                                                                     | 9.1                                                                                 | 0.7                                                                                 | 14.0                                                                                                                                                                    | 1.7                                                                                 |
| LnGrp Delay(d),s/veh         | 39.5                                                                              | 0.0                                                                               | 26.9                                                                                                                                                                | 46.5                                                                              | 0.0                                                                               | 0.0                                                                               | 42.2                                                                                                                                                                   | 15.4                                                                                                                                                                    | 15.4                                                                                | 44.5                                                                                | 22.1                                                                                                                                                                    | 14.9                                                                                |
| LnGrp LOS                    | D                                                                                 |                                                                                   | C                                                                                                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                                                                                                      | B                                                                                                                                                                       | B                                                                                   | D                                                                                   | C                                                                                                                                                                       | B                                                                                   |
| Approach Vol, veh/h          | 478                                                                               |                                                                                   | 20                                                                                                                                                                  |                                                                                   |                                                                                   | 1304                                                                              |                                                                                                                                                                        |                                                                                                                                                                         | 1374                                                                                |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Approach Delay, s/veh        | 32.8                                                                              |                                                                                   | 46.5                                                                                                                                                                |                                                                                   |                                                                                   | 21.6                                                                              |                                                                                                                                                                        |                                                                                                                                                                         | 22.0                                                                                |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Approach LOS                 | C                                                                                 |                                                                                   | D                                                                                                                                                                   |                                                                                   |                                                                                   | C                                                                                 |                                                                                                                                                                        |                                                                                                                                                                         | C                                                                                   |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                                                                                                      | 8                                                                                                                                                                       |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 4                                                                                                                                                                   |                                                                                   | 5                                                                                 | 6                                                                                 | 8                                                                                                                                                                      |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 17.3                                                                              | 51.8                                                                              | 9.1                                                                                                                                                                 |                                                                                   | 11.0                                                                              | 58.1                                                                              | 22.2                                                                                                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Change Period (Y+Rc), s      | 6.0                                                                               | 6.0                                                                               | 7.0                                                                                                                                                                 |                                                                                   | 6.0                                                                               | 6.0                                                                               | 7.0                                                                                                                                                                    |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Max Green Setting (Gmax), s  | 41.0                                                                              | 185.0                                                                             | 32.0                                                                                                                                                                |                                                                                   | 19.0                                                                              | 207.0                                                                             | 53.0                                                                                                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 10.5                                                                              | 30.4                                                                              | 3.1                                                                                                                                                                 |                                                                                   | 3.4                                                                               | 19.7                                                                              | 13.8                                                                                                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Green Ext Time (p_c), s      | 0.8                                                                               | 15.5                                                                              | 0.0                                                                                                                                                                 |                                                                                   | 0.0                                                                               | 8.3                                                                               | 1.4                                                                                                                                                                    |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                                                                                                     |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                        |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 23.6                                                                                                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                        |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | C                                                                                                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                        |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 8: Honoapiilani Highway & Leialii Parkway

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |                                                                                     |
| Traffic Volume (veh/h)       | 2                                                                                 | 0                                                                                 | 3                                                                                 | 130                                                                               | 1                                                                                 | 51                                                                                | 2                                                                                   | 1083                                                                                | 83                                                                                  | 78                                                                                  | 1558                                                                                | 6                                                                                   |
| Future Volume (veh/h)        | 2                                                                                 | 0                                                                                 | 3                                                                                 | 130                                                                               | 1                                                                                 | 51                                                                                | 2                                                                                   | 1083                                                                                | 83                                                                                  | 78                                                                                  | 1558                                                                                | 6                                                                                   |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 2                                                                                 | 0                                                                                 | 1                                                                                 | 141                                                                               | 1                                                                                 | 4                                                                                 | 2                                                                                   | 1177                                                                                | 86                                                                                  | 85                                                                                  | 1693                                                                                | 7                                                                                   |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 157                                                                               | 9                                                                                 | 60                                                                                | 228                                                                               | 40                                                                                | 159                                                                               | 5                                                                                   | 2418                                                                                | 177                                                                                 | 111                                                                                 | 2831                                                                                | 12                                                                                  |
| Arrive On Green              | 0.12                                                                              | 0.00                                                                              | 0.11                                                                              | 0.12                                                                              | 0.12                                                                              | 0.11                                                                              | 0.00                                                                                | 0.96                                                                                | 0.95                                                                                | 0.06                                                                                | 0.78                                                                                | 0.78                                                                                |
| Sat Flow, veh/h              | 912                                                                               | 74                                                                                | 493                                                                               | 1410                                                                              | 326                                                                               | 1306                                                                              | 1774                                                                                | 3345                                                                                | 244                                                                                 | 1774                                                                                | 3615                                                                                | 15                                                                                  |
| Grp Volume(v), veh/h         | 3                                                                                 | 0                                                                                 | 0                                                                                 | 141                                                                               | 0                                                                                 | 5                                                                                 | 2                                                                                   | 622                                                                                 | 641                                                                                 | 85                                                                                  | 828                                                                                 | 872                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1479                                                                              | 0                                                                                 | 0                                                                                 | 1410                                                                              | 0                                                                                 | 1632                                                                              | 1774                                                                                | 1770                                                                                | 1820                                                                                | 1774                                                                                | 1770                                                                                | 1860                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 12.4                                                                              | 0.0                                                                               | 0.4                                                                               | 0.1                                                                                 | 3.3                                                                                 | 3.4                                                                                 | 6.1                                                                                 | 24.8                                                                                | 24.9                                                                                |
| Cycle Q Clear(g_c), s        | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 12.6                                                                              | 0.0                                                                               | 0.4                                                                               | 0.1                                                                                 | 3.3                                                                                 | 3.4                                                                                 | 6.1                                                                                 | 24.8                                                                                | 24.9                                                                                |
| Prop In Lane                 | 0.67                                                                              |                                                                                   | 0.33                                                                              | 1.00                                                                              |                                                                                   | 0.80                                                                              | 1.00                                                                                |                                                                                     | 0.13                                                                                | 1.00                                                                                |                                                                                     | 0.01                                                                                |
| Lane Grp Cap(c), veh/h       | 226                                                                               | 0                                                                                 | 0                                                                                 | 228                                                                               | 0                                                                                 | 199                                                                               | 5                                                                                   | 1279                                                                                | 1316                                                                                | 111                                                                                 | 1386                                                                                | 1457                                                                                |
| V/C Ratio(X)                 | 0.01                                                                              | 0.00                                                                              | 0.00                                                                              | 0.62                                                                              | 0.00                                                                              | 0.03                                                                              | 0.42                                                                                | 0.49                                                                                | 0.49                                                                                | 0.76                                                                                | 0.60                                                                                | 0.60                                                                                |
| Avail Cap(c_a), veh/h        | 318                                                                               | 0                                                                                 | 0                                                                                 | 316                                                                               | 0                                                                                 | 301                                                                               | 150                                                                                 | 1279                                                                                | 1316                                                                                | 150                                                                                 | 1386                                                                                | 1457                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.33                                                                                | 1.33                                                                                | 1.33                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.91                                                                                | 0.91                                                                                | 0.91                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 50.4                                                                              | 0.0                                                                               | 0.0                                                                               | 55.6                                                                              | 0.0                                                                               | 50.6                                                                              | 64.7                                                                                | 0.8                                                                                 | 0.8                                                                                 | 60.0                                                                                | 5.8                                                                                 | 5.8                                                                                 |
| Incr Delay (d2), s/veh       | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 2.7                                                                               | 0.0                                                                               | 0.1                                                                               | 18.7                                                                                | 1.2                                                                                 | 1.2                                                                                 | 9.7                                                                                 | 1.9                                                                                 | 1.8                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 5.1                                                                               | 0.0                                                                               | 0.2                                                                               | 0.1                                                                                 | 1.7                                                                                 | 1.8                                                                                 | 3.3                                                                                 | 12.7                                                                                | 13.3                                                                                |
| LnGrp Delay(d),s/veh         | 50.4                                                                              | 0.0                                                                               | 0.0                                                                               | 58.4                                                                              | 0.0                                                                               | 50.7                                                                              | 83.4                                                                                | 2.0                                                                                 | 2.0                                                                                 | 69.6                                                                                | 7.7                                                                                 | 7.6                                                                                 |
| LnGrp LOS                    | D                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   | D                                                                                 | F                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 3                                                                                 |                                                                                   |                                                                                   | 146                                                                               |                                                                                   |                                                                                     | 1265                                                                                |                                                                                     |                                                                                     | 1785                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 50.4                                                                              |                                                                                   |                                                                                   | 58.1                                                                              |                                                                                   |                                                                                     | 2.1                                                                                 |                                                                                     |                                                                                     | 10.6                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 4.3                                                                               | 105.8                                                                             |                                                                                   | 19.9                                                                              | 12.2                                                                              | 98.0                                                                              |                                                                                     | 19.9                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 11.0                                                                              | 82.0                                                                              |                                                                                   | 23.0                                                                              | 11.0                                                                              | 82.0                                                                              |                                                                                     | 23.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.1                                                                               | 26.9                                                                              |                                                                                   | 14.6                                                                              | 8.1                                                                               | 5.4                                                                               |                                                                                     | 2.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 31.9                                                                              |                                                                                   | 0.3                                                                               | 0.0                                                                               | 20.4                                                                              |                                                                                     | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 9.4                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 9: Honoapiilani Highway & Front Street/Flemming Road

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |                                                                                   |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 114                                                                               | 3                                                                                 | 14                                                                                | 62                                                                                | 3                                                                                 | 11                                                                                | 11                                                                                  | 1045                                                                                | 15                                                                                  | 7                                                                                   | 1369                                                                                | 235                                                                                 |
| Future Volume (veh/h)        | 114                                                                               | 3                                                                                 | 14                                                                                | 62                                                                                | 3                                                                                 | 11                                                                                | 11                                                                                  | 1045                                                                                | 15                                                                                  | 7                                                                                   | 1369                                                                                | 235                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 124                                                                               | 3                                                                                 | 12                                                                                | 67                                                                                | 3                                                                                 | 7                                                                                 | 12                                                                                  | 1136                                                                                | 15                                                                                  | 8                                                                                   | 1488                                                                                | 182                                                                                 |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 0                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 206                                                                               | 4                                                                                 | 15                                                                                | 207                                                                               | 11                                                                                | 17                                                                                | 14                                                                                  | 2824                                                                                | 37                                                                                  | 10                                                                                  | 2786                                                                                | 1246                                                                                |
| Arrive On Green              | 0.11                                                                              | 0.11                                                                              | 0.10                                                                              | 0.11                                                                              | 0.11                                                                              | 0.10                                                                              | 0.01                                                                                | 0.53                                                                                | 0.52                                                                                | 0.01                                                                                | 0.79                                                                                | 0.79                                                                                |
| Sat Flow, veh/h              | 1366                                                                              | 33                                                                                | 132                                                                               | 1385                                                                              | 96                                                                                | 148                                                                               | 1774                                                                                | 3577                                                                                | 47                                                                                  | 1774                                                                                | 3539                                                                                | 1582                                                                                |
| Grp Volume(v), veh/h         | 139                                                                               | 0                                                                                 | 0                                                                                 | 77                                                                                | 0                                                                                 | 0                                                                                 | 12                                                                                  | 562                                                                                 | 589                                                                                 | 8                                                                                   | 1488                                                                                | 182                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1531                                                                              | 0                                                                                 | 0                                                                                 | 1629                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1854                                                                                | 1774                                                                                | 1770                                                                                | 1582                                                                                |
| Q Serve(g_s), s              | 5.8                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.9                                                                                 | 24.7                                                                                | 24.7                                                                                | 0.6                                                                                 | 20.1                                                                                | 3.6                                                                                 |
| Cycle Q Clear(g_c), s        | 11.3                                                                              | 0.0                                                                               | 0.0                                                                               | 5.5                                                                               | 0.0                                                                               | 0.0                                                                               | 0.9                                                                                 | 24.7                                                                                | 24.7                                                                                | 0.6                                                                                 | 20.1                                                                                | 3.6                                                                                 |
| Prop In Lane                 | 0.89                                                                              |                                                                                   | 0.09                                                                              | 0.87                                                                              |                                                                                   | 0.09                                                                              | 1.00                                                                                |                                                                                     | 0.03                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 224                                                                               | 0                                                                                 | 0                                                                                 | 235                                                                               | 0                                                                                 | 0                                                                                 | 14                                                                                  | 1397                                                                                | 1464                                                                                | 10                                                                                  | 2786                                                                                | 1246                                                                                |
| V/C Ratio(X)                 | 0.62                                                                              | 0.00                                                                              | 0.00                                                                              | 0.33                                                                              | 0.00                                                                              | 0.00                                                                              | 0.83                                                                                | 0.40                                                                                | 0.40                                                                                | 0.78                                                                                | 0.53                                                                                | 0.15                                                                                |
| Avail Cap(c_a), veh/h        | 349                                                                               | 0                                                                                 | 0                                                                                 | 360                                                                               | 0                                                                                 | 0                                                                                 | 109                                                                                 | 1397                                                                                | 1464                                                                                | 109                                                                                 | 2786                                                                                | 1246                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.67                                                                                | 0.67                                                                                | 0.67                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.86                                                                                | 0.86                                                                                | 0.86                                                                                | 0.74                                                                                | 0.74                                                                                | 0.74                                                                                |
| Uniform Delay (d), s/veh     | 56.0                                                                              | 0.0                                                                               | 0.0                                                                               | 53.7                                                                              | 0.0                                                                               | 0.0                                                                               | 64.6                                                                                | 12.3                                                                                | 12.3                                                                                | 64.5                                                                                | 5.1                                                                                 | 3.3                                                                                 |
| Incr Delay (d2), s/veh       | 2.8                                                                               | 0.0                                                                               | 0.0                                                                               | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 30.7                                                                                | 0.7                                                                                 | 0.7                                                                                 | 28.6                                                                                | 0.5                                                                                 | 0.2                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 5.0                                                                               | 0.0                                                                               | 0.0                                                                               | 2.6                                                                               | 0.0                                                                               | 0.0                                                                               | 0.6                                                                                 | 12.3                                                                                | 12.9                                                                                | 0.4                                                                                 | 9.9                                                                                 | 1.6                                                                                 |
| LnGrp Delay(d),s/veh         | 58.8                                                                              | 0.0                                                                               | 0.0                                                                               | 54.5                                                                              | 0.0                                                                               | 0.0                                                                               | 95.2                                                                                | 13.0                                                                                | 13.0                                                                                | 93.2                                                                                | 5.6                                                                                 | 3.5                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | F                                                                                   | B                                                                                   | B                                                                                   | F                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 139                                                                               |                                                                                   |                                                                                   | 77                                                                                |                                                                                   |                                                                                     | 1163                                                                                |                                                                                     |                                                                                     | 1678                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 58.8                                                                              |                                                                                   |                                                                                   | 54.5                                                                              |                                                                                   |                                                                                     | 13.8                                                                                |                                                                                     |                                                                                     | 5.8                                                                                 |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.1                                                                               | 106.3                                                                             |                                                                                   | 18.6                                                                              | 4.8                                                                               | 106.6                                                                             |                                                                                     | 18.6                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 8.0                                                                               | 83.0                                                                              |                                                                                   | 25.0                                                                              | 8.0                                                                               | 83.0                                                                              |                                                                                     | 25.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.9                                                                               | 22.1                                                                              |                                                                                   | 7.5                                                                               | 2.6                                                                               | 26.7                                                                              |                                                                                     | 13.3                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 40.8                                                                              |                                                                                   | 0.2                                                                               | 0.0                                                                               | 22.8                                                                              |                                                                                     | 0.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   |                                                                                   | 12.5                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 10: Honoapiilani Highway & Kapunakea Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |                                                                                     |  |  |                                                                                     |
| Traffic Volume (veh/h)       | 139                                                                               | 17                                                                                | 48                                                                                | 83                                                                                | 19                                                                                | 15                                                                                | 58                                                                                 | 1122                                                                                | 59                                                                                  | 14                                                                                  | 1389                                                                                | 118                                                                                 |
| Future Volume (veh/h)        | 139                                                                               | 17                                                                                | 48                                                                                | 83                                                                                | 19                                                                                | 15                                                                                | 58                                                                                 | 1122                                                                                | 59                                                                                  | 14                                                                                  | 1389                                                                                | 118                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                               |                                                                                     | 0.99                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 151                                                                               | 18                                                                                | 6                                                                                 | 90                                                                                | 21                                                                                | 2                                                                                 | 63                                                                                 | 1220                                                                                | 62                                                                                  | 15                                                                                  | 1510                                                                                | 124                                                                                 |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 232                                                                               | 21                                                                                | 241                                                                               | 302                                                                               | 256                                                                               | 24                                                                                | 80                                                                                 | 2552                                                                                | 130                                                                                 | 18                                                                                  | 2352                                                                                | 192                                                                                 |
| Arrive On Green              | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.09                                                                               | 1.00                                                                                | 1.00                                                                                | 0.01                                                                                | 0.94                                                                                | 0.93                                                                                |
| Sat Flow, veh/h              | 1175                                                                              | 140                                                                               | 1574                                                                              | 1384                                                                              | 1674                                                                              | 159                                                                               | 1774                                                                               | 3427                                                                                | 174                                                                                 | 1774                                                                                | 3314                                                                                | 270                                                                                 |
| Grp Volume(v), veh/h         | 169                                                                               | 0                                                                                 | 6                                                                                 | 90                                                                                | 0                                                                                 | 23                                                                                | 63                                                                                 | 630                                                                                 | 652                                                                                 | 15                                                                                  | 802                                                                                 | 832                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1315                                                                              | 0                                                                                 | 1574                                                                              | 1384                                                                              | 0                                                                                 | 1833                                                                              | 1774                                                                               | 1770                                                                                | 1831                                                                                | 1774                                                                                | 1770                                                                                | 1815                                                                                |
| Q Serve(g_s), s              | 15.1                                                                              | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 1.4                                                                               | 4.5                                                                                | 0.0                                                                                 | 0.0                                                                                 | 1.1                                                                                 | 8.3                                                                                 | 8.8                                                                                 |
| Cycle Q Clear(g_c), s        | 16.5                                                                              | 0.0                                                                               | 0.4                                                                               | 6.3                                                                               | 0.0                                                                               | 1.4                                                                               | 4.5                                                                                | 0.0                                                                                 | 0.0                                                                                 | 1.1                                                                                 | 8.3                                                                                 | 8.8                                                                                 |
| Prop In Lane                 | 0.89                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.09                                                                              | 1.00                                                                               |                                                                                     | 0.10                                                                                | 1.00                                                                                |                                                                                     | 0.15                                                                                |
| Lane Grp Cap(c), veh/h       | 254                                                                               | 0                                                                                 | 241                                                                               | 302                                                                               | 0                                                                                 | 280                                                                               | 80                                                                                 | 1318                                                                                | 1364                                                                                | 18                                                                                  | 1256                                                                                | 1288                                                                                |
| V/C Ratio(X)                 | 0.67                                                                              | 0.00                                                                              | 0.02                                                                              | 0.30                                                                              | 0.00                                                                              | 0.08                                                                              | 0.79                                                                               | 0.48                                                                                | 0.48                                                                                | 0.85                                                                                | 0.64                                                                                | 0.65                                                                                |
| Avail Cap(c_a), veh/h        | 331                                                                               | 0                                                                                 | 327                                                                               | 378                                                                               | 0                                                                                 | 381                                                                               | 109                                                                                | 1318                                                                                | 1364                                                                                | 109                                                                                 | 1256                                                                                | 1288                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 2.00                                                                               | 2.00                                                                                | 2.00                                                                                | 1.33                                                                                | 1.33                                                                                | 1.33                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.75                                                                               | 0.75                                                                                | 0.75                                                                                | 0.81                                                                                | 0.81                                                                                | 0.81                                                                                |
| Uniform Delay (d), s/veh     | 54.3                                                                              | 0.0                                                                               | 46.8                                                                              | 49.3                                                                              | 0.0                                                                               | 47.3                                                                              | 58.5                                                                               | 0.0                                                                                 | 0.0                                                                                 | 64.0                                                                                | 1.3                                                                                 | 1.3                                                                                 |
| Incr Delay (d2), s/veh       | 3.2                                                                               | 0.0                                                                               | 0.0                                                                               | 0.5                                                                               | 0.0                                                                               | 0.1                                                                               | 12.4                                                                               | 0.9                                                                                 | 0.9                                                                                 | 26.6                                                                                | 2.0                                                                                 | 2.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 6.1                                                                               | 0.0                                                                               | 0.2                                                                               | 2.9                                                                               | 0.0                                                                               | 0.7                                                                               | 2.5                                                                                | 0.3                                                                                 | 0.3                                                                                 | 0.7                                                                                 | 4.2                                                                                 | 4.7                                                                                 |
| LnGrp Delay(d),s/veh         | 57.6                                                                              | 0.0                                                                               | 46.9                                                                              | 49.9                                                                              | 0.0                                                                               | 47.4                                                                              | 70.9                                                                               | 0.9                                                                                 | 0.9                                                                                 | 90.6                                                                                | 3.3                                                                                 | 3.4                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 |                                                                                   | D                                                                                 | E                                                                                  | A                                                                                   | A                                                                                   | F                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 175                                                                               |                                                                                   |                                                                                   | 113                                                                               |                                                                                   |                                                                                    | 1345                                                                                |                                                                                     |                                                                                     | 1649                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 57.2                                                                              |                                                                                   |                                                                                   | 49.4                                                                              |                                                                                   |                                                                                    | 4.2                                                                                 |                                                                                     |                                                                                     | 4.1                                                                                 |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                    | A                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 9.9                                                                               | 96.3                                                                              |                                                                                   | 23.9                                                                              | 5.3                                                                               | 100.8                                                                             |                                                                                    | 23.9                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 8.0                                                                               | 82.0                                                                              |                                                                                   | 26.0                                                                              | 8.0                                                                               | 82.0                                                                              |                                                                                    | 26.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 6.5                                                                               | 10.8                                                                              |                                                                                   | 8.3                                                                               | 3.1                                                                               | 2.0                                                                               |                                                                                    | 18.5                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 33.8                                                                              |                                                                                   | 0.3                                                                               | 0.0                                                                               | 21.1                                                                              |                                                                                    | 0.4                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 8.6                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Notes</b>                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 11: Honoapiilani Highway & Keawe Street

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 51                                                                                | 112                                                                               | 124                                                                               | 191                                                                               | 93                                                                                | 381                                                                               | 108                                                                                 | 779                                                                                 | 256                                                                                 | 346                                                                                 | 952                                                                                 | 89                                                                                  |
| Future Volume (veh/h)        | 51                                                                                | 112                                                                               | 124                                                                               | 191                                                                               | 93                                                                                | 381                                                                               | 108                                                                                 | 779                                                                                 | 256                                                                                 | 346                                                                                 | 952                                                                                 | 89                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.96                                                                              |                                                                                   | 0.95                                                                              | 0.98                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                                |                                                                                     | 0.99                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 55                                                                                | 122                                                                               | 20                                                                                | 208                                                                               | 101                                                                               | 96                                                                                | 117                                                                                 | 847                                                                                 | 182                                                                                 | 376                                                                                 | 1035                                                                                | 93                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 103                                                                               | 187                                                                               | 240                                                                               | 315                                                                               | 555                                                                               | 459                                                                               | 143                                                                                 | 1343                                                                                | 592                                                                                 | 408                                                                                 | 1738                                                                                | 156                                                                                 |
| Arrive On Green              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.11                                                                              | 0.30                                                                              | 0.30                                                                              | 0.08                                                                                | 0.38                                                                                | 0.38                                                                                | 0.08                                                                                | 0.17                                                                                | 0.17                                                                                |
| Sat Flow, veh/h              | 421                                                                               | 1173                                                                              | 1503                                                                              | 1774                                                                              | 1863                                                                              | 1540                                                                              | 1774                                                                                | 3539                                                                                | 1560                                                                                | 1774                                                                                | 3285                                                                                | 295                                                                                 |
| Grp Volume(v), veh/h         | 177                                                                               | 0                                                                                 | 20                                                                                | 208                                                                               | 101                                                                               | 96                                                                                | 117                                                                                 | 847                                                                                 | 182                                                                                 | 376                                                                                 | 557                                                                                 | 571                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1593                                                                              | 0                                                                                 | 1503                                                                              | 1774                                                                              | 1863                                                                              | 1540                                                                              | 1774                                                                                | 1770                                                                                | 1560                                                                                | 1774                                                                                | 1770                                                                                | 1810                                                                                |
| Q Serve(g_s), s              | 10.8                                                                              | 0.0                                                                               | 1.5                                                                               | 12.4                                                                              | 5.2                                                                               | 6.1                                                                               | 8.4                                                                                 | 25.4                                                                                | 10.7                                                                                | 27.4                                                                                | 37.7                                                                                | 37.8                                                                                |
| Cycle Q Clear(g_c), s        | 13.4                                                                              | 0.0                                                                               | 1.5                                                                               | 12.4                                                                              | 5.2                                                                               | 6.1                                                                               | 8.4                                                                                 | 25.4                                                                                | 10.7                                                                                | 27.4                                                                                | 37.7                                                                                | 37.8                                                                                |
| Prop In Lane                 | 0.31                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 0.16                                                                                |
| Lane Grp Cap(c), veh/h       | 291                                                                               | 0                                                                                 | 240                                                                               | 315                                                                               | 555                                                                               | 459                                                                               | 143                                                                                 | 1343                                                                                | 592                                                                                 | 408                                                                                 | 936                                                                                 | 958                                                                                 |
| V/C Ratio(X)                 | 0.61                                                                              | 0.00                                                                              | 0.08                                                                              | 0.66                                                                              | 0.18                                                                              | 0.21                                                                              | 0.82                                                                                | 0.63                                                                                | 0.31                                                                                | 0.92                                                                                | 0.60                                                                                | 0.60                                                                                |
| Avail Cap(c_a), veh/h        | 353                                                                               | 0                                                                                 | 301                                                                               | 315                                                                               | 630                                                                               | 521                                                                               | 328                                                                                 | 1343                                                                                | 592                                                                                 | 491                                                                                 | 936                                                                                 | 958                                                                                 |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 0.33                                                                                | 0.33                                                                                | 0.33                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.79                                                                                | 0.79                                                                                | 0.79                                                                                | 0.71                                                                                | 0.71                                                                                | 0.71                                                                                |
| Uniform Delay (d), s/veh     | 51.3                                                                              | 0.0                                                                               | 46.5                                                                              | 39.0                                                                              | 33.8                                                                              | 34.1                                                                              | 58.9                                                                                | 32.9                                                                                | 28.3                                                                                | 58.9                                                                                | 40.8                                                                                | 40.9                                                                                |
| Incr Delay (d2), s/veh       | 2.1                                                                               | 0.0                                                                               | 0.1                                                                               | 5.1                                                                               | 0.2                                                                               | 0.2                                                                               | 3.5                                                                                 | 1.8                                                                                 | 1.1                                                                                 | 14.7                                                                                | 2.0                                                                                 | 1.9                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 6.2                                                                               | 0.0                                                                               | 0.6                                                                               | 6.5                                                                               | 2.7                                                                               | 2.6                                                                               | 4.3                                                                                 | 12.7                                                                                | 4.8                                                                                 | 15.1                                                                                | 19.0                                                                                | 19.5                                                                                |
| LnGrp Delay(d),s/veh         | 53.4                                                                              | 0.0                                                                               | 46.7                                                                              | 44.0                                                                              | 34.0                                                                              | 34.4                                                                              | 62.4                                                                                | 34.7                                                                                | 29.4                                                                                | 73.6                                                                                | 42.8                                                                                | 42.8                                                                                |
| LnGrp LOS                    | D                                                                                 |                                                                                   | D                                                                                 | D                                                                                 | C                                                                                 | C                                                                                 | E                                                                                   | C                                                                                   | C                                                                                   | E                                                                                   | D                                                                                   | D                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 197                                                                               |                                                                                   |                                                                                   | 405                                                                               |                                                                                   |                                                                                     | 1146                                                                                |                                                                                     |                                                                                     | 1504                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 52.7                                                                              |                                                                                   |                                                                                   | 39.2                                                                              |                                                                                   |                                                                                     | 36.7                                                                                |                                                                                     |                                                                                     | 50.5                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                     | D                                                                                   |                                                                                     |                                                                                     | D                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 14.4                                                                              | 72.8                                                                              | 18.0                                                                              | 24.8                                                                              | 33.9                                                                              | 53.3                                                                              |                                                                                     | 42.8                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 24.0                                                                              | 49.0                                                                              | 13.0                                                                              | 25.0                                                                              | 36.0                                                                              | 37.0                                                                              |                                                                                     | 43.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 10.4                                                                              | 39.8                                                                              | 14.4                                                                              | 15.4                                                                              | 29.4                                                                              | 27.4                                                                              |                                                                                     | 8.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.2                                                                               | 6.0                                                                               | 0.0                                                                               | 0.5                                                                               | 0.5                                                                               | 5.8                                                                               |                                                                                     | 0.8                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 44.4                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Notes</b>                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



---

## **APPENDIX C**

### **LEVEL OF SERVICE CALCULATIONS**

- Base Year 2022 AM Peak
-

# HCM 2010 Signalized Intersection Summary

## 1: Honoapiilani Highway & Napilihau Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 50                                                                                | 45                                                                                | 295                                                                               | 90                                                                                | 50                                                                                | 20                                                                                | 220                                                                                | 230                                                                                 | 100                                                                                 | 10                                                                                  | 135                                                                                 | 30                                                                                  |
| Future Volume (veh/h)        | 50                                                                                | 45                                                                                | 295                                                                               | 90                                                                                | 50                                                                                | 20                                                                                | 220                                                                                | 230                                                                                 | 100                                                                                 | 10                                                                                  | 135                                                                                 | 30                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                  | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.99                                                                              | 0.99                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 54                                                                                | 49                                                                                | 42                                                                                | 98                                                                                | 54                                                                                | 11                                                                                | 239                                                                                | 250                                                                                 | 51                                                                                  | 11                                                                                  | 147                                                                                 | 8                                                                                   |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 239                                                                               | 165                                                                               | 258                                                                               | 328                                                                               | 247                                                                               | 50                                                                                | 320                                                                                | 789                                                                                 | 671                                                                                 | 15                                                                                  | 469                                                                                 | 399                                                                                 |
| Arrive On Green              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.18                                                                               | 0.42                                                                                | 0.42                                                                                | 0.01                                                                                | 0.25                                                                                | 0.25                                                                                |
| Sat Flow, veh/h              | 612                                                                               | 999                                                                               | 1569                                                                              | 1291                                                                              | 1500                                                                              | 306                                                                               | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 103                                                                               | 0                                                                                 | 42                                                                                | 98                                                                                | 0                                                                                 | 65                                                                                | 239                                                                                | 250                                                                                 | 51                                                                                  | 11                                                                                  | 147                                                                                 | 8                                                                                   |
| Grp Sat Flow(s),veh/h/ln     | 1612                                                                              | 0                                                                                 | 1569                                                                              | 1291                                                                              | 0                                                                                 | 1806                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 0.5                                                                               | 0.0                                                                               | 0.9                                                                               | 2.9                                                                               | 0.0                                                                               | 1.2                                                                               | 5.1                                                                                | 3.5                                                                                 | 0.8                                                                                 | 0.2                                                                                 | 2.5                                                                                 | 0.2                                                                                 |
| Cycle Q Clear(g_c), s        | 2.0                                                                               | 0.0                                                                               | 0.9                                                                               | 4.9                                                                               | 0.0                                                                               | 1.2                                                                               | 5.1                                                                                | 3.5                                                                                 | 0.8                                                                                 | 0.2                                                                                 | 2.5                                                                                 | 0.2                                                                                 |
| Prop In Lane                 | 0.52                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.17                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 404                                                                               | 0                                                                                 | 258                                                                               | 328                                                                               | 0                                                                                 | 297                                                                               | 320                                                                                | 789                                                                                 | 671                                                                                 | 15                                                                                  | 469                                                                                 | 399                                                                                 |
| V/C Ratio(X)                 | 0.26                                                                              | 0.00                                                                              | 0.16                                                                              | 0.30                                                                              | 0.00                                                                              | 0.22                                                                              | 0.75                                                                               | 0.32                                                                                | 0.08                                                                                | 0.72                                                                                | 0.31                                                                                | 0.02                                                                                |
| Avail Cap(c_a), veh/h        | 1078                                                                              | 0                                                                                 | 948                                                                               | 896                                                                               | 0                                                                                 | 1091                                                                              | 1341                                                                               | 3706                                                                                | 3151                                                                                | 670                                                                                 | 3003                                                                                | 2552                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 14.7                                                                              | 0.0                                                                               | 14.2                                                                              | 16.9                                                                              | 0.0                                                                               | 14.4                                                                              | 15.4                                                                               | 7.6                                                                                 | 6.8                                                                                 | 19.6                                                                                | 12.1                                                                                | 11.2                                                                                |
| Incr Delay (d2), s/veh       | 0.3                                                                               | 0.0                                                                               | 0.3                                                                               | 0.5                                                                               | 0.0                                                                               | 0.4                                                                               | 3.5                                                                                | 0.5                                                                                 | 0.1                                                                                 | 47.2                                                                                | 0.8                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.0                                                                               | 0.0                                                                               | 0.4                                                                               | 1.1                                                                               | 0.0                                                                               | 0.6                                                                               | 2.8                                                                                | 1.9                                                                                 | 0.3                                                                                 | 0.3                                                                                 | 1.4                                                                                 | 0.1                                                                                 |
| LnGrp Delay(d),s/veh         | 15.0                                                                              | 0.0                                                                               | 14.5                                                                              | 17.4                                                                              | 0.0                                                                               | 14.7                                                                              | 18.9                                                                               | 8.1                                                                                 | 6.9                                                                                 | 66.8                                                                                | 12.9                                                                                | 11.2                                                                                |
| LnGrp LOS                    | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                  | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 145                                                                               |                                                                                   |                                                                                   | 163                                                                               |                                                                                   |                                                                                    | 540                                                                                 |                                                                                     |                                                                                     | 166                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 14.9                                                                              |                                                                                   |                                                                                   | 16.3                                                                              |                                                                                   |                                                                                    | 12.8                                                                                |                                                                                     |                                                                                     | 16.4                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.3                                                                               | 22.8                                                                              |                                                                                   | 11.5                                                                              | 12.2                                                                              | 16.0                                                                              |                                                                                    | 11.5                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 79.0                                                                              |                                                                                   | 24.0                                                                              | 30.0                                                                              | 64.0                                                                              |                                                                                    | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.2                                                                               | 5.5                                                                               |                                                                                   | 4.0                                                                               | 7.1                                                                               | 4.5                                                                               |                                                                                    | 6.9                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 3.7                                                                               |                                                                                   | 0.6                                                                               | 0.7                                                                               | 1.8                                                                               |                                                                                    | 0.6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 14.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## HCM 2010 Signalized Intersection Summary

### 2: Honoapiilani Highway & Hoohui Road

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 60                                                                                | 5                                                                                 | 180                                                                               | 90                                                                                | 20                                                                                | 15                                                                                | 135                                                                                | 515                                                                                 | 15                                                                                  | 10                                                                                  | 515                                                                                 | 65                                                                                  |
| Future Volume (veh/h)        | 60                                                                                | 5                                                                                 | 180                                                                               | 90                                                                                | 20                                                                                | 15                                                                                | 135                                                                                | 515                                                                                 | 15                                                                                  | 10                                                                                  | 515                                                                                 | 65                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                  | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                              |                                                                                   | 0.97                                                                              | 0.98                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 0.99                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 65                                                                                | 5                                                                                 | 20                                                                                | 98                                                                                | 22                                                                                | 2                                                                                 | 147                                                                                | 560                                                                                 | 0                                                                                   | 11                                                                                  | 560                                                                                 | 28                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 381                                                                               | 24                                                                                | 309                                                                               | 347                                                                               | 336                                                                               | 31                                                                                | 409                                                                                | 878                                                                                 | 746                                                                                 | 365                                                                                 | 725                                                                                 | 612                                                                                 |
| Arrive On Green              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.09                                                                               | 0.47                                                                                | 0.00                                                                                | 0.01                                                                                | 0.39                                                                                | 0.39                                                                                |
| Sat Flow, veh/h              | 1209                                                                              | 122                                                                               | 1544                                                                              | 1351                                                                              | 1679                                                                              | 153                                                                               | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1571                                                                                |
| Grp Volume(v), veh/h         | 70                                                                                | 0                                                                                 | 20                                                                                | 98                                                                                | 0                                                                                 | 24                                                                                | 147                                                                                | 560                                                                                 | 0                                                                                   | 11                                                                                  | 560                                                                                 | 28                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1331                                                                              | 0                                                                                 | 1544                                                                              | 1351                                                                              | 0                                                                                 | 1831                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1571                                                                                |
| Q Serve(g_s), s              | 1.9                                                                               | 0.0                                                                               | 0.5                                                                               | 3.3                                                                               | 0.0                                                                               | 0.5                                                                               | 2.2                                                                                | 11.3                                                                                | 0.0                                                                                 | 0.2                                                                                 | 13.1                                                                                | 0.6                                                                                 |
| Cycle Q Clear(g_c), s        | 2.5                                                                               | 0.0                                                                               | 0.5                                                                               | 5.8                                                                               | 0.0                                                                               | 0.5                                                                               | 2.2                                                                                | 11.3                                                                                | 0.0                                                                                 | 0.2                                                                                 | 13.1                                                                                | 0.6                                                                                 |
| Prop In Lane                 | 0.93                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 405                                                                               | 0                                                                                 | 309                                                                               | 347                                                                               | 0                                                                                 | 366                                                                               | 409                                                                                | 878                                                                                 | 746                                                                                 | 365                                                                                 | 725                                                                                 | 612                                                                                 |
| V/C Ratio(X)                 | 0.17                                                                              | 0.00                                                                              | 0.06                                                                              | 0.28                                                                              | 0.00                                                                              | 0.07                                                                              | 0.36                                                                               | 0.64                                                                                | 0.00                                                                                | 0.03                                                                                | 0.77                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h        | 819                                                                               | 0                                                                                 | 773                                                                               | 754                                                                               | 0                                                                                 | 917                                                                               | 782                                                                                | 1903                                                                                | 1618                                                                                | 883                                                                                 | 1903                                                                                | 1605                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 0.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 17.1                                                                              | 0.0                                                                               | 16.2                                                                              | 19.4                                                                              | 0.0                                                                               | 16.2                                                                              | 9.2                                                                                | 10.0                                                                                | 0.0                                                                                 | 9.6                                                                                 | 13.3                                                                                | 9.5                                                                                 |
| Incr Delay (d2), s/veh       | 0.2                                                                               | 0.0                                                                               | 0.1                                                                               | 0.4                                                                               | 0.0                                                                               | 0.1                                                                               | 0.5                                                                                | 0.8                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 1.8                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.8                                                                               | 0.0                                                                               | 0.2                                                                               | 1.3                                                                               | 0.0                                                                               | 0.3                                                                               | 1.1                                                                                | 5.9                                                                                 | 0.0                                                                                 | 0.1                                                                                 | 7.0                                                                                 | 0.2                                                                                 |
| LnGrp Delay(d),s/veh         | 17.3                                                                              | 0.0                                                                               | 16.3                                                                              | 19.9                                                                              | 0.0                                                                               | 16.3                                                                              | 9.8                                                                                | 10.8                                                                                | 0.0                                                                                 | 9.7                                                                                 | 15.1                                                                                | 9.5                                                                                 |
| LnGrp LOS                    | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                 |                                                                                   | B                                                                                 | A                                                                                  | B                                                                                   |                                                                                     | A                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 90                                                                                |                                                                                   |                                                                                   | 122                                                                               |                                                                                   |                                                                                    | 707                                                                                 |                                                                                     |                                                                                     | 599                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 17.1                                                                              |                                                                                   |                                                                                   | 19.2                                                                              |                                                                                   |                                                                                    | 10.6                                                                                |                                                                                     |                                                                                     | 14.7                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.4                                                                               | 29.5                                                                              |                                                                                   | 15.0                                                                              | 9.5                                                                               | 25.4                                                                              |                                                                                    | 15.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 51.0                                                                              |                                                                                   | 25.0                                                                              | 15.0                                                                              | 51.0                                                                              |                                                                                    | 25.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.2                                                                               | 13.3                                                                              |                                                                                   | 4.5                                                                               | 4.2                                                                               | 15.1                                                                              |                                                                                    | 7.8                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 4.0                                                                               |                                                                                   | 0.4                                                                               | 0.3                                                                               | 4.1                                                                               |                                                                                    | 0.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 13.3                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 3: Honoapiilani Highway & Akahele Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 40                                                                                | 5                                                                                 | 125                                                                               | 5                                                                                 | 5                                                                                 | 5                                                                                 | 60                                                                                 | 600                                                                                 | 15                                                                                  | 5                                                                                   | 715                                                                                 | 30                                                                                  |
| Future Volume (veh/h)        | 40                                                                                | 5                                                                                 | 125                                                                               | 5                                                                                 | 5                                                                                 | 5                                                                                 | 60                                                                                 | 600                                                                                 | 15                                                                                  | 5                                                                                   | 715                                                                                 | 30                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                  | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 0.99                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 43                                                                                | 5                                                                                 | 11                                                                                | 5                                                                                 | 5                                                                                 | 1                                                                                 | 65                                                                                 | 652                                                                                 | 9                                                                                   | 5                                                                                   | 777                                                                                 | 17                                                                                  |
| Adj No. of Lanes             | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 60                                                                                | 63                                                                                | 139                                                                               | 9                                                                                 | 175                                                                               | 147                                                                               | 84                                                                                 | 1010                                                                                | 858                                                                                 | 7                                                                                   | 929                                                                                 | 784                                                                                 |
| Arrive On Green              | 0.03                                                                              | 0.12                                                                              | 0.12                                                                              | 0.01                                                                              | 0.09                                                                              | 0.09                                                                              | 0.05                                                                               | 0.54                                                                                | 0.54                                                                                | 0.00                                                                                | 0.50                                                                                | 0.50                                                                                |
| Sat Flow, veh/h              | 1774                                                                              | 515                                                                               | 1132                                                                              | 1774                                                                              | 1863                                                                              | 1564                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1572                                                                                |
| Grp Volume(v), veh/h         | 43                                                                                | 0                                                                                 | 16                                                                                | 5                                                                                 | 5                                                                                 | 1                                                                                 | 65                                                                                 | 652                                                                                 | 9                                                                                   | 5                                                                                   | 777                                                                                 | 17                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1774                                                                              | 0                                                                                 | 1646                                                                              | 1774                                                                              | 1863                                                                              | 1564                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1572                                                                                |
| Q Serve(g_s), s              | 1.5                                                                               | 0.0                                                                               | 0.5                                                                               | 0.2                                                                               | 0.1                                                                               | 0.0                                                                               | 2.2                                                                                | 15.1                                                                                | 0.2                                                                                 | 0.2                                                                                 | 22.0                                                                                | 0.3                                                                                 |
| Cycle Q Clear(g_c), s        | 1.5                                                                               | 0.0                                                                               | 0.5                                                                               | 0.2                                                                               | 0.1                                                                               | 0.0                                                                               | 2.2                                                                                | 15.1                                                                                | 0.2                                                                                 | 0.2                                                                                 | 22.0                                                                                | 0.3                                                                                 |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 0.69                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 60                                                                                | 0                                                                                 | 202                                                                               | 9                                                                                 | 175                                                                               | 147                                                                               | 84                                                                                 | 1010                                                                                | 858                                                                                 | 7                                                                                   | 929                                                                                 | 784                                                                                 |
| V/C Ratio(X)                 | 0.72                                                                              | 0.00                                                                              | 0.08                                                                              | 0.53                                                                              | 0.03                                                                              | 0.01                                                                              | 0.77                                                                               | 0.65                                                                                | 0.01                                                                                | 0.71                                                                                | 0.84                                                                                | 0.02                                                                                |
| Avail Cap(c_a), veh/h        | 578                                                                               | 0                                                                                 | 563                                                                               | 578                                                                               | 637                                                                               | 535                                                                               | 723                                                                                | 1973                                                                                | 1677                                                                                | 723                                                                                 | 1973                                                                                | 1665                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 29.4                                                                              | 0.0                                                                               | 23.9                                                                              | 30.4                                                                              | 25.3                                                                              | 25.2                                                                              | 28.9                                                                               | 9.9                                                                                 | 6.5                                                                                 | 30.5                                                                                | 13.2                                                                                | 7.8                                                                                 |
| Incr Delay (d2), s/veh       | 14.6                                                                              | 0.0                                                                               | 0.2                                                                               | 39.1                                                                              | 0.1                                                                               | 0.0                                                                               | 13.8                                                                               | 0.7                                                                                 | 0.0                                                                                 | 81.5                                                                                | 2.1                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.0                                                                               | 0.0                                                                               | 0.2                                                                               | 0.2                                                                               | 0.1                                                                               | 0.0                                                                               | 1.4                                                                                | 7.8                                                                                 | 0.1                                                                                 | 0.2                                                                                 | 11.8                                                                                | 0.1                                                                                 |
| LnGrp Delay(d),s/veh         | 44.0                                                                              | 0.0                                                                               | 24.0                                                                              | 69.5                                                                              | 25.3                                                                              | 25.2                                                                              | 42.7                                                                               | 10.6                                                                                | 6.5                                                                                 | 112.0                                                                               | 15.3                                                                                | 7.8                                                                                 |
| LnGrp LOS                    | D                                                                                 |                                                                                   | C                                                                                 | E                                                                                 | C                                                                                 | C                                                                                 | D                                                                                  | B                                                                                   | A                                                                                   | F                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 59                                                                                |                                                                                   |                                                                                   |                                                                                   | 11                                                                                |                                                                                   | 726                                                                                |                                                                                     |                                                                                     |                                                                                     | 799                                                                                 |                                                                                     |
| Approach Delay, s/veh        | 38.6                                                                              |                                                                                   |                                                                                   |                                                                                   | 45.4                                                                              |                                                                                   | 13.4                                                                               |                                                                                     |                                                                                     |                                                                                     | 15.8                                                                                |                                                                                     |
| Approach LOS                 | D                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                   | B                                                                                  |                                                                                     |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.2                                                                               | 38.3                                                                              | 5.3                                                                               | 12.5                                                                              | 7.9                                                                               | 35.6                                                                              | 7.1                                                                                | 10.8                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              | 25.0                                                                              | 65.0                                                                              | 20.0                                                                               | 21.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.2                                                                               | 17.1                                                                              | 2.2                                                                               | 2.5                                                                               | 4.2                                                                               | 24.0                                                                              | 3.5                                                                                | 2.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 5.1                                                                               | 0.0                                                                               | 0.0                                                                               | 0.1                                                                               | 6.6                                                                               | 0.1                                                                                | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          | 15.7                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 4: Honoapiilani Highway & Lower Honoapiilani Road

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 35                                                                                | 10                                                                                | 480                                                                               | 20                                                                                | 5                                                                                 | 0                                                                                 | 315                                                                                | 675                                                                                 | 45                                                                                  | 10                                                                                  | 805                                                                                 | 10                                                                                  |
| Future Volume (veh/h)        | 35                                                                                | 10                                                                                | 480                                                                               | 20                                                                                | 5                                                                                 | 0                                                                                 | 315                                                                                | 675                                                                                 | 45                                                                                  | 10                                                                                  | 805                                                                                 | 10                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 1.00                                                                              | 0.99                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 38                                                                                | 11                                                                                | 0                                                                                 | 22                                                                                | 5                                                                                 | 0                                                                                 | 342                                                                                | 734                                                                                 | 48                                                                                  | 11                                                                                  | 875                                                                                 | 3                                                                                   |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 195                                                                               | 31                                                                                | 117                                                                               | 200                                                                               | 31                                                                                | 0                                                                                 | 411                                                                                | 2202                                                                                | 144                                                                                 | 15                                                                                  | 1521                                                                                | 680                                                                                 |
| Arrive On Green              | 0.09                                                                              | 0.07                                                                              | 0.00                                                                              | 0.09                                                                              | 0.07                                                                              | 0.00                                                                              | 0.23                                                                               | 0.65                                                                                | 0.65                                                                                | 0.01                                                                                | 0.43                                                                                | 0.43                                                                                |
| Sat Flow, veh/h              | 1112                                                                              | 417                                                                               | 1583                                                                              | 1143                                                                              | 422                                                                               | 0                                                                                 | 1774                                                                               | 3373                                                                                | 220                                                                                 | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 49                                                                                | 0                                                                                 | 0                                                                                 | 27                                                                                | 0                                                                                 | 0                                                                                 | 342                                                                                | 385                                                                                 | 397                                                                                 | 11                                                                                  | 875                                                                                 | 3                                                                                   |
| Grp Sat Flow(s),veh/h/ln     | 1530                                                                              | 0                                                                                 | 1583                                                                              | 1565                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                               | 1770                                                                                | 1824                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 10.4                                                                               | 5.5                                                                                 | 5.5                                                                                 | 0.3                                                                                 | 10.6                                                                                | 0.1                                                                                 |
| Cycle Q Clear(g_c), s        | 1.6                                                                               | 0.0                                                                               | 0.0                                                                               | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 10.4                                                                               | 5.5                                                                                 | 5.5                                                                                 | 0.3                                                                                 | 10.6                                                                                | 0.1                                                                                 |
| Prop In Lane                 | 0.78                                                                              |                                                                                   | 1.00                                                                              | 0.81                                                                              |                                                                                   | 0.00                                                                              | 1.00                                                                               |                                                                                     | 0.12                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 253                                                                               | 0                                                                                 | 117                                                                               | 258                                                                               | 0                                                                                 | 0                                                                                 | 411                                                                                | 1155                                                                                | 1190                                                                                | 15                                                                                  | 1521                                                                                | 680                                                                                 |
| V/C Ratio(X)                 | 0.19                                                                              | 0.00                                                                              | 0.00                                                                              | 0.10                                                                              | 0.00                                                                              | 0.00                                                                              | 0.83                                                                               | 0.33                                                                                | 0.33                                                                                | 0.74                                                                                | 0.58                                                                                | 0.00                                                                                |
| Avail Cap(c_a), veh/h        | 667                                                                               | 0                                                                                 | 560                                                                               | 796                                                                               | 0                                                                                 | 0                                                                                 | 2070                                                                               | 2315                                                                                | 2386                                                                                | 2070                                                                                | 4631                                                                                | 2072                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 24.6                                                                              | 0.0                                                                               | 0.0                                                                               | 24.2                                                                              | 0.0                                                                               | 0.0                                                                               | 20.7                                                                               | 4.4                                                                                 | 4.4                                                                                 | 28.0                                                                                | 12.2                                                                                | 9.2                                                                                 |
| Incr Delay (d2), s/veh       | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 1.7                                                                                | 0.4                                                                                 | 0.3                                                                                 | 22.7                                                                                | 0.7                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 5.2                                                                                | 2.7                                                                                 | 2.8                                                                                 | 0.3                                                                                 | 5.3                                                                                 | 0.0                                                                                 |
| LnGrp Delay(d),s/veh         | 25.0                                                                              | 0.0                                                                               | 0.0                                                                               | 24.4                                                                              | 0.0                                                                               | 0.0                                                                               | 22.4                                                                               | 4.7                                                                                 | 4.7                                                                                 | 50.7                                                                                | 13.0                                                                                | 9.2                                                                                 |
| LnGrp LOS                    | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                  | A                                                                                   | A                                                                                   | D                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 49                                                                                |                                                                                   |                                                                                   | 27                                                                                |                                                                                   |                                                                                    | 1124                                                                                |                                                                                     |                                                                                     | 889                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 25.0                                                                              |                                                                                   |                                                                                   | 24.4                                                                              |                                                                                   |                                                                                    | 10.1                                                                                |                                                                                     |                                                                                     | 13.4                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 17.1                                                                              | 30.3                                                                              |                                                                                   | 9.2                                                                               | 4.5                                                                               | 42.9                                                                              |                                                                                    | 9.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 66.0                                                                              | 74.0                                                                              |                                                                                   | 25.0                                                                              | 66.0                                                                              | 74.0                                                                              |                                                                                    | 20.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 12.4                                                                              | 12.6                                                                              |                                                                                   | 2.8                                                                               | 2.3                                                                               | 7.5                                                                               |                                                                                    | 3.6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.8                                                                               | 11.7                                                                              |                                                                                   | 0.0                                                                               | 0.0                                                                               | 9.0                                                                               |                                                                                    | 0.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 12.0                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 5: Honoapiilani Highway & Kai Malina Parkway/Halawai Drive

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 30                                                                                | 0                                                                                 | 70                                                                                | 10                                                                                | 5                                                                                 | 10                                                                                | 135                                                                                 | 1085                                                                                | 20                                                                                  | 15                                                                                  | 1275                                                                                | 65                                                                                  |
| Future Volume (veh/h)        | 30                                                                                | 0                                                                                 | 70                                                                                | 10                                                                                | 5                                                                                 | 10                                                                                | 135                                                                                 | 1085                                                                                | 20                                                                                  | 15                                                                                  | 1275                                                                                | 65                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 33                                                                                | 0                                                                                 | 1                                                                                 | 11                                                                                | 5                                                                                 | 1                                                                                 | 147                                                                                 | 1179                                                                                | 21                                                                                  | 16                                                                                  | 1386                                                                                | 38                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 180                                                                               | 0                                                                                 | 73                                                                                | 121                                                                               | 19                                                                                | 3                                                                                 | 186                                                                                 | 2603                                                                                | 46                                                                                  | 20                                                                                  | 2259                                                                                | 1011                                                                                |
| Arrive On Green              | 0.06                                                                              | 0.00                                                                              | 0.05                                                                              | 0.06                                                                              | 0.05                                                                              | 0.05                                                                              | 0.10                                                                                | 0.73                                                                                | 0.73                                                                                | 0.01                                                                                | 0.64                                                                                | 0.64                                                                                |
| Sat Flow, veh/h              | 1553                                                                              | 0                                                                                 | 1583                                                                              | 701                                                                               | 414                                                                               | 70                                                                                | 1774                                                                                | 3558                                                                                | 63                                                                                  | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 33                                                                                | 0                                                                                 | 1                                                                                 | 17                                                                                | 0                                                                                 | 0                                                                                 | 147                                                                                 | 586                                                                                 | 614                                                                                 | 16                                                                                  | 1386                                                                                | 38                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1553                                                                              | 0                                                                                 | 1583                                                                              | 1185                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1852                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 5.4                                                                                 | 8.8                                                                                 | 8.8                                                                                 | 0.6                                                                                 | 15.5                                                                                | 0.6                                                                                 |
| Cycle Q Clear(g_c), s        | 1.2                                                                               | 0.0                                                                               | 0.0                                                                               | 1.6                                                                               | 0.0                                                                               | 0.0                                                                               | 5.4                                                                                 | 8.8                                                                                 | 8.8                                                                                 | 0.6                                                                                 | 15.5                                                                                | 0.6                                                                                 |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.65                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                                |                                                                                     | 0.03                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 203                                                                               | 0                                                                                 | 73                                                                                | 162                                                                               | 0                                                                                 | 0                                                                                 | 186                                                                                 | 1295                                                                                | 1355                                                                                | 20                                                                                  | 2259                                                                                | 1011                                                                                |
| V/C Ratio(X)                 | 0.16                                                                              | 0.00                                                                              | 0.01                                                                              | 0.11                                                                              | 0.00                                                                              | 0.00                                                                              | 0.79                                                                                | 0.45                                                                                | 0.45                                                                                | 0.78                                                                                | 0.61                                                                                | 0.04                                                                                |
| Avail Cap(c_a), veh/h        | 625                                                                               | 0                                                                                 | 548                                                                               | 621                                                                               | 0                                                                                 | 0                                                                                 | 561                                                                                 | 2292                                                                                | 2398                                                                                | 294                                                                                 | 4050                                                                                | 1812                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 30.3                                                                              | 0.0                                                                               | 30.2                                                                              | 30.8                                                                              | 0.0                                                                               | 0.0                                                                               | 29.0                                                                                | 3.6                                                                                 | 3.6                                                                                 | 32.7                                                                                | 7.1                                                                                 | 4.4                                                                                 |
| Incr Delay (d2), s/veh       | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 2.8                                                                                 | 0.5                                                                                 | 0.5                                                                                 | 20.7                                                                                | 0.6                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.6                                                                               | 0.0                                                                               | 0.0                                                                               | 0.3                                                                               | 0.0                                                                               | 0.0                                                                               | 2.8                                                                                 | 4.4                                                                                 | 4.6                                                                                 | 0.4                                                                                 | 7.5                                                                                 | 0.3                                                                                 |
| LnGrp Delay(d),s/veh         | 30.4                                                                              | 0.0                                                                               | 30.3                                                                              | 30.9                                                                              | 0.0                                                                               | 0.0                                                                               | 31.8                                                                                | 4.1                                                                                 | 4.1                                                                                 | 53.5                                                                                | 7.7                                                                                 | 4.5                                                                                 |
| LnGrp LOS                    | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                 |                                                                                   |                                                                                   | C                                                                                   | A                                                                                   | A                                                                                   | D                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 34                                                                                |                                                                                   | 17                                                                                |                                                                                   |                                                                                   | 1347                                                                              |                                                                                     |                                                                                     | 1440                                                                                |                                                                                     |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 30.4                                                                              |                                                                                   | 30.9                                                                              |                                                                                   |                                                                                   | 7.1                                                                               |                                                                                     |                                                                                     | 8.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |
| Approach LOS                 | C                                                                                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 4                                                                                 |                                                                                   | 5                                                                                 | 6                                                                                 | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 11.0                                                                              | 47.4                                                                              | 8.0                                                                               |                                                                                   | 4.8                                                                               | 53.6                                                                              | 8.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   | 4.0                                                                               | 5.0                                                                               | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 21.0                                                                              | 76.0                                                                              | 23.0                                                                              |                                                                                   | 11.0                                                                              | 86.0                                                                              | 23.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 7.4                                                                               | 17.5                                                                              | 3.6                                                                               |                                                                                   | 2.6                                                                               | 10.8                                                                              | 3.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.1                                                                               | 24.9                                                                              | 0.0                                                                               |                                                                                   | 0.0                                                                               | 18.3                                                                              | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 8.1                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 6: Honoapiilani Highway & Kai Ala Drive/Puukolii Road

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 55                                                                                | 5                                                                                 | 35                                                                                | 40                                                                                | 15                                                                                | 45                                                                                | 110                                                                                | 1225                                                                                | 60                                                                                  | 25                                                                                  | 1225                                                                                | 45                                                                                  |
| Future Volume (veh/h)        | 55                                                                                | 5                                                                                 | 35                                                                                | 40                                                                                | 15                                                                                | 45                                                                                | 110                                                                                | 1225                                                                                | 60                                                                                  | 25                                                                                  | 1225                                                                                | 45                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 60                                                                                | 5                                                                                 | 1                                                                                 | 43                                                                                | 16                                                                                | 1                                                                                 | 120                                                                                | 1332                                                                                | 50                                                                                  | 27                                                                                  | 1332                                                                                | 35                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 2                                                                                   | 1                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 160                                                                               | 12                                                                                | 153                                                                               | 111                                                                               | 168                                                                               | 10                                                                                | 142                                                                                | 2776                                                                                | 1242                                                                                | 39                                                                                  | 2571                                                                                | 1150                                                                                |
| Arrive On Green              | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.08                                                                               | 0.78                                                                                | 0.78                                                                                | 0.02                                                                                | 0.73                                                                                | 0.73                                                                                |
| Sat Flow, veh/h              | 1193                                                                              | 120                                                                               | 1578                                                                              | 1401                                                                              | 1735                                                                              | 108                                                                               | 1774                                                                               | 3539                                                                                | 1583                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 65                                                                                | 0                                                                                 | 1                                                                                 | 43                                                                                | 0                                                                                 | 17                                                                                | 120                                                                                | 1332                                                                                | 50                                                                                  | 27                                                                                  | 1332                                                                                | 35                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1313                                                                              | 0                                                                                 | 1578                                                                              | 1401                                                                              | 0                                                                                 | 1843                                                                              | 1774                                                                               | 1770                                                                                | 1583                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 6.6                                                                               | 0.0                                                                               | 0.1                                                                               | 4.7                                                                               | 0.0                                                                               | 1.3                                                                               | 10.3                                                                               | 20.2                                                                                | 1.1                                                                                 | 2.3                                                                                 | 25.6                                                                                | 1.0                                                                                 |
| Cycle Q Clear(g_c), s        | 7.9                                                                               | 0.0                                                                               | 0.1                                                                               | 12.5                                                                              | 0.0                                                                               | 1.3                                                                               | 10.3                                                                               | 20.2                                                                                | 1.1                                                                                 | 2.3                                                                                 | 25.6                                                                                | 1.0                                                                                 |
| Prop In Lane                 | 0.92                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 172                                                                               | 0                                                                                 | 153                                                                               | 111                                                                               | 0                                                                                 | 178                                                                               | 142                                                                                | 2776                                                                                | 1242                                                                                | 39                                                                                  | 2571                                                                                | 1150                                                                                |
| V/C Ratio(X)                 | 0.38                                                                              | 0.00                                                                              | 0.01                                                                              | 0.39                                                                              | 0.00                                                                              | 0.10                                                                              | 0.85                                                                               | 0.48                                                                                | 0.04                                                                                | 0.69                                                                                | 0.52                                                                                | 0.03                                                                                |
| Avail Cap(c_a), veh/h        | 254                                                                               | 0                                                                                 | 244                                                                               | 192                                                                               | 0                                                                                 | 285                                                                               | 240                                                                                | 2776                                                                                | 1242                                                                                | 240                                                                                 | 2571                                                                                | 1150                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.70                                                                               | 0.70                                                                                | 0.70                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 67.3                                                                              | 0.0                                                                               | 63.3                                                                              | 72.8                                                                              | 0.0                                                                               | 63.8                                                                              | 70.4                                                                               | 5.8                                                                                 | 3.7                                                                                 | 75.2                                                                                | 9.3                                                                                 | 5.9                                                                                 |
| Incr Delay (d2), s/veh       | 1.4                                                                               | 0.0                                                                               | 0.0                                                                               | 2.2                                                                               | 0.0                                                                               | 0.2                                                                               | 3.7                                                                                | 0.4                                                                                 | 0.0                                                                                 | 7.6                                                                                 | 0.7                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 2.7                                                                               | 0.0                                                                               | 0.0                                                                               | 1.9                                                                               | 0.0                                                                               | 0.7                                                                               | 5.2                                                                                | 10.0                                                                                | 0.5                                                                                 | 1.2                                                                                 | 12.7                                                                                | 0.4                                                                                 |
| LnGrp Delay(d),s/veh         | 68.7                                                                              | 0.0                                                                               | 63.3                                                                              | 75.0                                                                              | 0.0                                                                               | 64.1                                                                              | 74.0                                                                               | 6.2                                                                                 | 3.8                                                                                 | 82.9                                                                                | 10.0                                                                                | 6.0                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                  | A                                                                                   | A                                                                                   | F                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 66                                                                                |                                                                                   |                                                                                   | 60                                                                                |                                                                                   |                                                                                    | 1502                                                                                |                                                                                     |                                                                                     | 1394                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 68.6                                                                              |                                                                                   |                                                                                   | 71.9                                                                              |                                                                                   |                                                                                    | 11.5                                                                                |                                                                                     |                                                                                     | 11.3                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 16.4                                                                              | 118.6                                                                             |                                                                                   | 20.0                                                                              | 7.4                                                                               | 127.6                                                                             |                                                                                    | 20.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 21.0                                                                              | 95.0                                                                              |                                                                                   | 24.0                                                                              | 21.0                                                                              | 95.0                                                                              |                                                                                    | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 12.3                                                                              | 27.6                                                                              |                                                                                   | 14.5                                                                              | 4.3                                                                               | 22.2                                                                              |                                                                                    | 9.9                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.1                                                                               | 24.4                                                                              |                                                                                   | 0.1                                                                               | 0.0                                                                               | 25.2                                                                              |                                                                                    | 0.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 13.9                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 7: Honoapiilani Highway & Kaanapali Parkway/Halelo Street

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 135                                                                               | 10                                                                                | 220                                                                               | 10                                                                                | 10                                                                                | 10                                                                                | 425                                                                                 | 1310                                                                                | 15                                                                                  | 80                                                                                  | 1185                                                                                | 95                                                                                  |
| Future Volume (veh/h)        | 135                                                                               | 10                                                                                | 220                                                                               | 10                                                                                | 10                                                                                | 10                                                                                | 425                                                                                 | 1310                                                                                | 15                                                                                  | 80                                                                                  | 1185                                                                                | 95                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 147                                                                               | 11                                                                                | 67                                                                                | 11                                                                                | 11                                                                                | 3                                                                                 | 462                                                                                 | 1424                                                                                | 16                                                                                  | 87                                                                                  | 1288                                                                                | 76                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 2                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 220                                                                               | 16                                                                                | 825                                                                               | 60                                                                                | 60                                                                                | 16                                                                                | 601                                                                                 | 2033                                                                                | 23                                                                                  | 147                                                                                 | 1683                                                                                | 947                                                                                 |
| Arrive On Green              | 0.13                                                                              | 0.13                                                                              | 0.12                                                                              | 0.08                                                                              | 0.08                                                                              | 0.05                                                                              | 0.17                                                                                | 0.57                                                                                | 0.55                                                                                | 0.08                                                                                | 0.48                                                                                | 0.48                                                                                |
| Sat Flow, veh/h              | 1656                                                                              | 124                                                                               | 2731                                                                              | 783                                                                               | 783                                                                               | 214                                                                               | 3442                                                                                | 3585                                                                                | 40                                                                                  | 1774                                                                                | 3539                                                                                | 1577                                                                                |
| Grp Volume(v), veh/h         | 158                                                                               | 0                                                                                 | 67                                                                                | 25                                                                                | 0                                                                                 | 0                                                                                 | 462                                                                                 | 703                                                                                 | 737                                                                                 | 87                                                                                  | 1288                                                                                | 76                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1780                                                                              | 0                                                                                 | 1365                                                                              | 1780                                                                              | 0                                                                                 | 0                                                                                 | 1721                                                                                | 1770                                                                                | 1856                                                                                | 1774                                                                                | 1770                                                                                | 1577                                                                                |
| Q Serve(g_s), s              | 9.6                                                                               | 0.0                                                                               | 2.0                                                                               | 1.5                                                                               | 0.0                                                                               | 0.0                                                                               | 14.6                                                                                | 32.4                                                                                | 32.5                                                                                | 5.4                                                                                 | 34.2                                                                                | 2.3                                                                                 |
| Cycle Q Clear(g_c), s        | 9.6                                                                               | 0.0                                                                               | 2.0                                                                               | 1.5                                                                               | 0.0                                                                               | 0.0                                                                               | 14.6                                                                                | 32.4                                                                                | 32.5                                                                                | 5.4                                                                                 | 34.2                                                                                | 2.3                                                                                 |
| Prop In Lane                 | 0.93                                                                              |                                                                                   | 1.00                                                                              | 0.44                                                                              |                                                                                   | 0.12                                                                              | 1.00                                                                                |                                                                                     | 0.02                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 237                                                                               | 0                                                                                 | 825                                                                               | 136                                                                               | 0                                                                                 | 0                                                                                 | 601                                                                                 | 1004                                                                                | 1053                                                                                | 147                                                                                 | 1683                                                                                | 947                                                                                 |
| V/C Ratio(X)                 | 0.67                                                                              | 0.00                                                                              | 0.08                                                                              | 0.18                                                                              | 0.00                                                                              | 0.00                                                                              | 0.77                                                                                | 0.70                                                                                | 0.70                                                                                | 0.59                                                                                | 0.77                                                                                | 0.08                                                                                |
| Avail Cap(c_a), veh/h        | 532                                                                               | 0                                                                                 | 1278                                                                              | 485                                                                               | 0                                                                                 | 0                                                                                 | 1753                                                                                | 3015                                                                                | 3162                                                                                | 234                                                                                 | 4694                                                                                | 2289                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 47.0                                                                              | 0.0                                                                               | 28.7                                                                              | 49.4                                                                              | 0.0                                                                               | 0.0                                                                               | 44.8                                                                                | 17.7                                                                                | 17.7                                                                                | 50.3                                                                                | 24.6                                                                                | 9.6                                                                                 |
| Incr Delay (d2), s/veh       | 1.2                                                                               | 0.0                                                                               | 0.0                                                                               | 0.6                                                                               | 0.0                                                                               | 0.0                                                                               | 0.8                                                                                 | 1.3                                                                                 | 1.2                                                                                 | 1.4                                                                                 | 1.1                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 4.8                                                                               | 0.0                                                                               | 0.8                                                                               | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 7.0                                                                                 | 16.2                                                                                | 17.0                                                                                | 2.7                                                                                 | 16.9                                                                                | 1.3                                                                                 |
| LnGrp Delay(d),s/veh         | 48.2                                                                              | 0.0                                                                               | 28.7                                                                              | 50.1                                                                              | 0.0                                                                               | 0.0                                                                               | 45.6                                                                                | 19.0                                                                                | 18.9                                                                                | 51.8                                                                                | 25.7                                                                                | 9.6                                                                                 |
| LnGrp LOS                    | D                                                                                 |                                                                                   | C                                                                                 | D                                                                                 |                                                                                   |                                                                                   | D                                                                                   | B                                                                                   | B                                                                                   | D                                                                                   | C                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 225                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 25                                                                                | 1902                                                                                |                                                                                     |                                                                                     | 1451                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 42.4                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 50.1                                                                              | 25.4                                                                                |                                                                                     |                                                                                     | 26.4                                                                                |                                                                                     |                                                                                     |
| Approach LOS                 | D                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   | D                                                                                 | C                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 4                                                                                 |                                                                                   | 5                                                                                 | 6                                                                                 | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 23.9                                                                              | 58.1                                                                              | 12.7                                                                              |                                                                                   | 13.4                                                                              | 68.6                                                                              | 19.1                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 6.0                                                                               | 6.0                                                                               | 7.0                                                                               |                                                                                   | 6.0                                                                               | 6.0                                                                               | 7.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 56.0                                                                              | 149.0                                                                             | 28.0                                                                              |                                                                                   | 13.0                                                                              | 192.0                                                                             | 31.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 16.6                                                                              | 36.2                                                                              | 3.5                                                                               |                                                                                   | 7.4                                                                               | 34.5                                                                              | 11.6                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 1.3                                                                               | 16.0                                                                              | 0.0                                                                               |                                                                                   | 0.1                                                                               | 16.4                                                                              | 0.5                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 27.0                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 8: Honoapiilani Highway & Leialii Parkway

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |                                                                                     |
| Traffic Volume (veh/h)       | 5                                                                                 | 5                                                                                 | 5                                                                                 | 60                                                                                | 0                                                                                 | 45                                                                                | 5                                                                                   | 1745                                                                                | 90                                                                                  | 30                                                                                  | 1385                                                                                | 5                                                                                   |
| Future Volume (veh/h)        | 5                                                                                 | 5                                                                                 | 5                                                                                 | 60                                                                                | 0                                                                                 | 45                                                                                | 5                                                                                   | 1745                                                                                | 90                                                                                  | 30                                                                                  | 1385                                                                                | 5                                                                                   |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                              |                                                                                   | 0.97                                                                              | 0.98                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 5                                                                                 | 5                                                                                 | 1                                                                                 | 65                                                                                | 0                                                                                 | 1                                                                                 | 5                                                                                   | 1897                                                                                | 96                                                                                  | 33                                                                                  | 1505                                                                                | 5                                                                                   |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 90                                                                                | 80                                                                                | 13                                                                                | 176                                                                               | 0                                                                                 | 138                                                                               | 11                                                                                  | 2706                                                                                | 136                                                                                 | 63                                                                                  | 2961                                                                                | 10                                                                                  |
| Arrive On Green              | 0.09                                                                              | 0.09                                                                              | 0.08                                                                              | 0.09                                                                              | 0.00                                                                              | 0.08                                                                              | 0.01                                                                                | 0.79                                                                                | 0.78                                                                                | 0.04                                                                                | 0.82                                                                                | 0.81                                                                                |
| Sat Flow, veh/h              | 584                                                                               | 895                                                                               | 148                                                                               | 1372                                                                              | 0                                                                                 | 1543                                                                              | 1774                                                                                | 3429                                                                                | 172                                                                                 | 1774                                                                                | 3618                                                                                | 12                                                                                  |
| Grp Volume(v), veh/h         | 11                                                                                | 0                                                                                 | 0                                                                                 | 65                                                                                | 0                                                                                 | 1                                                                                 | 5                                                                                   | 971                                                                                 | 1022                                                                                | 33                                                                                  | 736                                                                                 | 774                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1627                                                                              | 0                                                                                 | 0                                                                                 | 1372                                                                              | 0                                                                                 | 1543                                                                              | 1774                                                                                | 1770                                                                                | 1832                                                                                | 1774                                                                                | 1770                                                                                | 1861                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 5.4                                                                               | 0.0                                                                               | 0.1                                                                               | 0.4                                                                                 | 35.9                                                                                | 37.3                                                                                | 2.6                                                                                 | 18.1                                                                                | 18.1                                                                                |
| Cycle Q Clear(g_c), s        | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 6.1                                                                               | 0.0                                                                               | 0.1                                                                               | 0.4                                                                                 | 35.9                                                                                | 37.3                                                                                | 2.6                                                                                 | 18.1                                                                                | 18.1                                                                                |
| Prop In Lane                 | 0.45                                                                              |                                                                                   | 0.09                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 0.09                                                                                | 1.00                                                                                |                                                                                     | 0.01                                                                                |
| Lane Grp Cap(c), veh/h       | 183                                                                               | 0                                                                                 | 0                                                                                 | 176                                                                               | 0                                                                                 | 138                                                                               | 11                                                                                  | 1396                                                                                | 1446                                                                                | 63                                                                                  | 1448                                                                                | 1523                                                                                |
| V/C Ratio(X)                 | 0.06                                                                              | 0.00                                                                              | 0.00                                                                              | 0.37                                                                              | 0.00                                                                              | 0.01                                                                              | 0.45                                                                                | 0.70                                                                                | 0.71                                                                                | 0.52                                                                                | 0.51                                                                                | 0.51                                                                                |
| Avail Cap(c_a), veh/h        | 312                                                                               | 0                                                                                 | 0                                                                                 | 289                                                                               | 0                                                                                 | 265                                                                               | 101                                                                                 | 1396                                                                                | 1446                                                                                | 101                                                                                 | 1448                                                                                | 1523                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.64                                                                                | 0.64                                                                                | 0.64                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 58.4                                                                              | 0.0                                                                               | 0.0                                                                               | 60.7                                                                              | 0.0                                                                               | 58.5                                                                              | 69.3                                                                                | 6.9                                                                                 | 7.1                                                                                 | 66.3                                                                                | 3.9                                                                                 | 4.0                                                                                 |
| Incr Delay (d2), s/veh       | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 1.3                                                                               | 0.0                                                                               | 0.0                                                                               | 6.5                                                                                 | 1.9                                                                                 | 1.9                                                                                 | 2.5                                                                                 | 1.3                                                                                 | 1.2                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 2.5                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                                 | 18.0                                                                                | 19.2                                                                                | 1.3                                                                                 | 9.1                                                                                 | 9.5                                                                                 |
| LnGrp Delay(d),s/veh         | 58.6                                                                              | 0.0                                                                               | 0.0                                                                               | 62.0                                                                              | 0.0                                                                               | 58.6                                                                              | 75.8                                                                                | 8.8                                                                                 | 9.0                                                                                 | 68.8                                                                                | 5.2                                                                                 | 5.2                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 11                                                                                |                                                                                   |                                                                                   | 66                                                                                |                                                                                   |                                                                                     | 1998                                                                                |                                                                                     |                                                                                     | 1543                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 58.6                                                                              |                                                                                   |                                                                                   | 62.0                                                                              |                                                                                   |                                                                                     | 9.0                                                                                 |                                                                                     |                                                                                     | 6.6                                                                                 |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 4.9                                                                               | 118.6                                                                             |                                                                                   | 16.5                                                                              | 9.0                                                                               | 114.5                                                                             |                                                                                     | 16.5                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 8.0                                                                               | 95.0                                                                              |                                                                                   | 23.0                                                                              | 8.0                                                                               | 95.0                                                                              |                                                                                     | 23.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.4                                                                               | 20.1                                                                              |                                                                                   | 8.1                                                                               | 4.6                                                                               | 39.3                                                                              |                                                                                     | 2.8                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 29.0                                                                              |                                                                                   | 0.1                                                                               | 0.0                                                                               | 41.2                                                                              |                                                                                     | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   |                                                                                   | 9.1                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 9: Honoapiilani Highway & Front Street/Flemming Road

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |                                                                                   |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 90                                                                                | 5                                                                                 | 5                                                                                 | 105                                                                               | 15                                                                                | 15                                                                                | 5                                                                                   | 1725                                                                                | 20                                                                                  | 10                                                                                  | 1230                                                                                | 185                                                                                 |
| Future Volume (veh/h)        | 90                                                                                | 5                                                                                 | 5                                                                                 | 105                                                                               | 15                                                                                | 15                                                                                | 5                                                                                   | 1725                                                                                | 20                                                                                  | 10                                                                                  | 1230                                                                                | 185                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 98                                                                                | 5                                                                                 | 3                                                                                 | 114                                                                               | 16                                                                                | 12                                                                                | 5                                                                                   | 1875                                                                                | 21                                                                                  | 11                                                                                  | 1337                                                                                | 141                                                                                 |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 0                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 210                                                                               | 8                                                                                 | 5                                                                                 | 198                                                                               | 20                                                                                | 15                                                                                | 7                                                                                   | 2805                                                                                | 31                                                                                  | 14                                                                                  | 2782                                                                                | 1243                                                                                |
| Arrive On Green              | 0.11                                                                              | 0.11                                                                              | 0.10                                                                              | 0.11                                                                              | 0.11                                                                              | 0.10                                                                              | 0.00                                                                                | 0.78                                                                                | 0.77                                                                                | 0.01                                                                                | 0.79                                                                                | 0.79                                                                                |
| Sat Flow, veh/h              | 1387                                                                              | 71                                                                                | 42                                                                                | 1312                                                                              | 184                                                                               | 138                                                                               | 1774                                                                                | 3585                                                                                | 40                                                                                  | 1774                                                                                | 3539                                                                                | 1581                                                                                |
| Grp Volume(v), veh/h         | 106                                                                               | 0                                                                                 | 0                                                                                 | 142                                                                               | 0                                                                                 | 0                                                                                 | 5                                                                                   | 924                                                                                 | 972                                                                                 | 11                                                                                  | 1337                                                                                | 141                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1500                                                                              | 0                                                                                 | 0                                                                                 | 1634                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1856                                                                                | 1774                                                                                | 1770                                                                                | 1581                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 1.8                                                                               | 0.0                                                                               | 0.0                                                                               | 0.3                                                                                 | 28.5                                                                                | 28.8                                                                                | 0.7                                                                                 | 15.6                                                                                | 2.5                                                                                 |
| Cycle Q Clear(g_c), s        | 7.9                                                                               | 0.0                                                                               | 0.0                                                                               | 9.8                                                                               | 0.0                                                                               | 0.0                                                                               | 0.3                                                                                 | 28.5                                                                                | 28.8                                                                                | 0.7                                                                                 | 15.6                                                                                | 2.5                                                                                 |
| Prop In Lane                 | 0.92                                                                              |                                                                                   | 0.03                                                                              | 0.80                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                                |                                                                                     | 0.02                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 223                                                                               | 0                                                                                 | 0                                                                                 | 234                                                                               | 0                                                                                 | 0                                                                                 | 7                                                                                   | 1384                                                                                | 1452                                                                                | 14                                                                                  | 2782                                                                                | 1243                                                                                |
| V/C Ratio(X)                 | 0.48                                                                              | 0.00                                                                              | 0.00                                                                              | 0.61                                                                              | 0.00                                                                              | 0.00                                                                              | 0.73                                                                                | 0.67                                                                                | 0.67                                                                                | 0.81                                                                                | 0.48                                                                                | 0.11                                                                                |
| Avail Cap(c_a), veh/h        | 430                                                                               | 0                                                                                 | 0                                                                                 | 450                                                                               | 0                                                                                 | 0                                                                                 | 118                                                                                 | 1384                                                                                | 1452                                                                                | 118                                                                                 | 2782                                                                                | 1243                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.64                                                                                | 0.64                                                                                | 0.64                                                                                | 0.86                                                                                | 0.86                                                                                | 0.86                                                                                |
| Uniform Delay (d), s/veh     | 51.1                                                                              | 0.0                                                                               | 0.0                                                                               | 51.8                                                                              | 0.0                                                                               | 0.0                                                                               | 59.7                                                                                | 5.9                                                                                 | 6.0                                                                                 | 59.5                                                                                | 4.4                                                                                 | 3.0                                                                                 |
| Incr Delay (d2), s/veh       | 1.6                                                                               | 0.0                                                                               | 0.0                                                                               | 2.5                                                                               | 0.0                                                                               | 0.0                                                                               | 30.1                                                                                | 1.7                                                                                 | 1.6                                                                                 | 28.7                                                                                | 0.5                                                                                 | 0.2                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 3.5                                                                               | 0.0                                                                               | 0.0                                                                               | 4.7                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                                 | 14.2                                                                                | 15.0                                                                                | 0.5                                                                                 | 7.6                                                                                 | 1.2                                                                                 |
| LnGrp Delay(d),s/veh         | 52.6                                                                              | 0.0                                                                               | 0.0                                                                               | 54.3                                                                              | 0.0                                                                               | 0.0                                                                               | 89.8                                                                                | 7.6                                                                                 | 7.6                                                                                 | 88.2                                                                                | 4.9                                                                                 | 3.2                                                                                 |
| LnGrp LOS                    | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | F                                                                                   | A                                                                                   | A                                                                                   | F                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 106                                                                               |                                                                                   |                                                                                   | 142                                                                               |                                                                                   |                                                                                     | 1901                                                                                |                                                                                     |                                                                                     | 1489                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 52.6                                                                              |                                                                                   |                                                                                   | 54.3                                                                              |                                                                                   |                                                                                     | 7.8                                                                                 |                                                                                     |                                                                                     | 5.4                                                                                 |                                                                                     |
| Approach LOS                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 4.5                                                                               | 98.3                                                                              |                                                                                   | 17.2                                                                              | 4.9                                                                               | 97.9                                                                              |                                                                                     | 17.2                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 8.0                                                                               | 68.0                                                                              |                                                                                   | 30.0                                                                              | 8.0                                                                               | 68.0                                                                              |                                                                                     | 30.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.3                                                                               | 17.6                                                                              |                                                                                   | 11.8                                                                              | 2.7                                                                               | 30.8                                                                              |                                                                                     | 9.9                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 31.2                                                                              |                                                                                   | 0.5                                                                               | 0.0                                                                               | 32.5                                                                              |                                                                                     | 0.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 9.9                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 10: Honoapiilani Highway & Kapunakea Street

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 145                                                                               | 30                                                                                | 20                                                                                | 145                                                                               | 25                                                                                | 35                                                                                | 25                                                                                  | 1550                                                                                | 75                                                                                  | 10                                                                                  | 1270                                                                                | 70                                                                                  |
| Future Volume (veh/h)        | 145                                                                               | 30                                                                                | 20                                                                                | 145                                                                               | 25                                                                                | 35                                                                                | 25                                                                                  | 1550                                                                                | 75                                                                                  | 10                                                                                  | 1270                                                                                | 70                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.98                                                                              | 0.99                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 158                                                                               | 33                                                                                | 2                                                                                 | 158                                                                               | 27                                                                                | 5                                                                                 | 27                                                                                  | 1685                                                                                | 80                                                                                  | 11                                                                                  | 1380                                                                                | 73                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 229                                                                               | 38                                                                                | 265                                                                               | 307                                                                               | 259                                                                               | 48                                                                                | 34                                                                                  | 2536                                                                                | 120                                                                                 | 13                                                                                  | 2480                                                                                | 131                                                                                 |
| Arrive On Green              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.16                                                                              | 0.04                                                                                | 1.00                                                                                | 1.00                                                                                | 0.01                                                                                | 0.73                                                                                | 0.72                                                                                |
| Sat Flow, veh/h              | 1070                                                                              | 224                                                                               | 1558                                                                              | 1358                                                                              | 1525                                                                              | 282                                                                               | 1774                                                                                | 3441                                                                                | 163                                                                                 | 1774                                                                                | 3420                                                                                | 181                                                                                 |
| Grp Volume(v), veh/h         | 191                                                                               | 0                                                                                 | 2                                                                                 | 158                                                                               | 0                                                                                 | 32                                                                                | 27                                                                                  | 862                                                                                 | 903                                                                                 | 11                                                                                  | 713                                                                                 | 740                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1294                                                                              | 0                                                                                 | 1558                                                                              | 1358                                                                              | 0                                                                                 | 1807                                                                              | 1774                                                                                | 1770                                                                                | 1834                                                                                | 1774                                                                                | 1770                                                                                | 1831                                                                                |
| Q Serve(g_s), s              | 18.4                                                                              | 0.0                                                                               | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 2.1                                                                               | 2.1                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.9                                                                                 | 25.9                                                                                | 26.2                                                                                |
| Cycle Q Clear(g_c), s        | 20.5                                                                              | 0.0                                                                               | 0.1                                                                               | 13.4                                                                              | 0.0                                                                               | 2.1                                                                               | 2.1                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.9                                                                                 | 25.9                                                                                | 26.2                                                                                |
| Prop In Lane                 | 0.83                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.16                                                                              | 1.00                                                                                |                                                                                     | 0.09                                                                                | 1.00                                                                                |                                                                                     | 0.10                                                                                |
| Lane Grp Cap(c), veh/h       | 267                                                                               | 0                                                                                 | 265                                                                               | 307                                                                               | 0                                                                                 | 307                                                                               | 34                                                                                  | 1304                                                                                | 1352                                                                                | 13                                                                                  | 1283                                                                                | 1328                                                                                |
| V/C Ratio(X)                 | 0.72                                                                              | 0.00                                                                              | 0.01                                                                              | 0.51                                                                              | 0.00                                                                              | 0.10                                                                              | 0.79                                                                                | 0.66                                                                                | 0.67                                                                                | 0.83                                                                                | 0.56                                                                                | 0.56                                                                                |
| Avail Cap(c_a), veh/h        | 310                                                                               | 0                                                                                 | 312                                                                               | 348                                                                               | 0                                                                                 | 361                                                                               | 139                                                                                 | 1304                                                                                | 1352                                                                                | 139                                                                                 | 1283                                                                                | 1328                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.50                                                                                | 0.50                                                                                | 0.50                                                                                | 0.86                                                                                | 0.86                                                                                | 0.86                                                                                |
| Uniform Delay (d), s/veh     | 57.8                                                                              | 0.0                                                                               | 48.3                                                                              | 53.8                                                                              | 0.0                                                                               | 49.2                                                                              | 67.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 69.4                                                                                | 8.8                                                                                 | 8.9                                                                                 |
| Incr Delay (d2), s/veh       | 6.5                                                                               | 0.0                                                                               | 0.0                                                                               | 1.3                                                                               | 0.0                                                                               | 0.1                                                                               | 7.6                                                                                 | 1.3                                                                                 | 1.3                                                                                 | 32.4                                                                                | 1.5                                                                                 | 1.5                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 7.7                                                                               | 0.0                                                                               | 0.1                                                                               | 5.8                                                                               | 0.0                                                                               | 1.1                                                                               | 1.1                                                                                 | 0.5                                                                                 | 0.5                                                                                 | 0.5                                                                                 | 13.0                                                                                | 13.7                                                                                |
| LnGrp Delay(d),s/veh         | 64.2                                                                              | 0.0                                                                               | 48.3                                                                              | 55.1                                                                              | 0.0                                                                               | 49.3                                                                              | 74.7                                                                                | 1.3                                                                                 | 1.3                                                                                 | 101.8                                                                               | 10.3                                                                                | 10.4                                                                                |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | E                                                                                 |                                                                                   | D                                                                                 | E                                                                                   | A                                                                                   | A                                                                                   | F                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          | 193                                                                               |                                                                                   |                                                                                   |                                                                                   | 190                                                                               |                                                                                   | 1792                                                                                |                                                                                     |                                                                                     |                                                                                     | 1464                                                                                |                                                                                     |
| Approach Delay, s/veh        | 64.1                                                                              |                                                                                   |                                                                                   |                                                                                   | 54.2                                                                              |                                                                                   | 2.4                                                                                 |                                                                                     |                                                                                     |                                                                                     | 11.0                                                                                |                                                                                     |
| Approach LOS                 | E                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                   | A                                                                                   |                                                                                     |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 4                                                                                 |                                                                                   | 5                                                                                 | 6                                                                                 | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 6.7                                                                               | 105.5                                                                             | 27.8                                                                              |                                                                                   | 5.0                                                                               | 107.2                                                                             | 27.8                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   | 4.0                                                                               | 5.0                                                                               | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 11.0                                                                              | 88.0                                                                              | 27.0                                                                              |                                                                                   | 11.0                                                                              | 88.0                                                                              | 27.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 4.1                                                                               | 28.2                                                                              | 15.4                                                                              |                                                                                   | 2.9                                                                               | 2.0                                                                               | 22.5                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 25.1                                                                              | 0.5                                                                               |                                                                                   | 0.0                                                                               | 43.0                                                                              | 0.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 11.9                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 11: Honoapiilani Highway & Keawe Street

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 15                                                                                | 110                                                                               | 35                                                                                | 95                                                                                | 75                                                                                | 715                                                                               | 25                                                                                  | 865                                                                                 | 120                                                                                 | 515                                                                                 | 860                                                                                 | 20                                                                                  |
| Future Volume (veh/h)        | 15                                                                                | 110                                                                               | 35                                                                                | 95                                                                                | 75                                                                                | 715                                                                               | 25                                                                                  | 865                                                                                 | 120                                                                                 | 515                                                                                 | 860                                                                                 | 20                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.99                                                                              | 0.99                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 16                                                                                | 120                                                                               | 5                                                                                 | 103                                                                               | 82                                                                                | 439                                                                               | 27                                                                                  | 940                                                                                 | 53                                                                                  | 560                                                                                 | 935                                                                                 | 21                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   | 2                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 52                                                                                | 341                                                                               | 328                                                                               | 353                                                                               | 567                                                                               | 478                                                                               | 34                                                                                  | 1527                                                                                | 680                                                                                 | 614                                                                                 | 2090                                                                                | 47                                                                                  |
| Arrive On Green              | 0.21                                                                              | 0.21                                                                              | 0.21                                                                              | 0.07                                                                              | 0.30                                                                              | 0.30                                                                              | 0.02                                                                                | 0.43                                                                                | 0.43                                                                                | 0.36                                                                                | 1.00                                                                                | 1.00                                                                                |
| Sat Flow, veh/h              | 110                                                                               | 1627                                                                              | 1563                                                                              | 1774                                                                              | 1863                                                                              | 1569                                                                              | 1774                                                                                | 3539                                                                                | 1576                                                                                | 3442                                                                                | 3539                                                                                | 79                                                                                  |
| Grp Volume(v), veh/h         | 136                                                                               | 0                                                                                 | 5                                                                                 | 103                                                                               | 82                                                                                | 439                                                                               | 27                                                                                  | 940                                                                                 | 53                                                                                  | 560                                                                                 | 468                                                                                 | 488                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1737                                                                              | 0                                                                                 | 1563                                                                              | 1774                                                                              | 1863                                                                              | 1569                                                                              | 1774                                                                                | 1770                                                                                | 1576                                                                                | 1721                                                                                | 1770                                                                                | 1849                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 6.1                                                                               | 4.5                                                                               | 37.8                                                                              | 2.1                                                                                 | 28.8                                                                                | 2.8                                                                                 | 21.7                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Cycle Q Clear(g_c), s        | 8.7                                                                               | 0.0                                                                               | 0.4                                                                               | 6.1                                                                               | 4.5                                                                               | 37.8                                                                              | 2.1                                                                                 | 28.8                                                                                | 2.8                                                                                 | 21.7                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Prop In Lane                 | 0.12                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 0.04                                                                                |
| Lane Grp Cap(c), veh/h       | 393                                                                               | 0                                                                                 | 328                                                                               | 353                                                                               | 567                                                                               | 478                                                                               | 34                                                                                  | 1527                                                                                | 680                                                                                 | 614                                                                                 | 1045                                                                                | 1092                                                                                |
| V/C Ratio(X)                 | 0.35                                                                              | 0.00                                                                              | 0.02                                                                              | 0.29                                                                              | 0.14                                                                              | 0.92                                                                              | 0.79                                                                                | 0.62                                                                                | 0.08                                                                                | 0.91                                                                                | 0.45                                                                                | 0.45                                                                                |
| Avail Cap(c_a), veh/h        | 393                                                                               | 0                                                                                 | 328                                                                               | 528                                                                               | 665                                                                               | 560                                                                               | 177                                                                                 | 1527                                                                                | 680                                                                                 | 836                                                                                 | 1045                                                                                | 1092                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.79                                                                                | 0.79                                                                                | 0.79                                                                                | 0.74                                                                                | 0.74                                                                                | 0.74                                                                                |
| Uniform Delay (d), s/veh     | 47.1                                                                              | 0.0                                                                               | 43.8                                                                              | 37.9                                                                              | 35.4                                                                              | 47.0                                                                              | 68.4                                                                                | 30.8                                                                                | 23.4                                                                                | 44.0                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Incr Delay (d2), s/veh       | 0.5                                                                               | 0.0                                                                               | 0.0                                                                               | 0.5                                                                               | 0.1                                                                               | 18.7                                                                              | 11.4                                                                                | 1.5                                                                                 | 0.2                                                                                 | 7.4                                                                                 | 1.0                                                                                 | 1.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 4.6                                                                               | 0.0                                                                               | 0.2                                                                               | 3.0                                                                               | 2.3                                                                               | 18.9                                                                              | 1.2                                                                                 | 14.4                                                                                | 1.2                                                                                 | 10.9                                                                                | 0.3                                                                                 | 0.3                                                                                 |
| LnGrp Delay(d),s/veh         | 47.7                                                                              | 0.0                                                                               | 43.9                                                                              | 38.3                                                                              | 35.5                                                                              | 65.7                                                                              | 79.8                                                                                | 32.3                                                                                | 23.6                                                                                | 51.4                                                                                | 1.0                                                                                 | 1.0                                                                                 |
| LnGrp LOS                    | D                                                                                 |                                                                                   | D                                                                                 | D                                                                                 | D                                                                                 | E                                                                                 | E                                                                                   | C                                                                                   | C                                                                                   | D                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 141                                                                               |                                                                                   |                                                                                   | 624                                                                               |                                                                                   |                                                                                     | 1020                                                                                |                                                                                     |                                                                                     | 1516                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 47.5                                                                              |                                                                                   |                                                                                   | 57.2                                                                              |                                                                                   |                                                                                     | 33.1                                                                                |                                                                                     |                                                                                     | 19.6                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                     | C                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 6.7                                                                               | 86.7                                                                              | 13.2                                                                              | 33.4                                                                              | 29.0                                                                              | 64.4                                                                              |                                                                                     | 46.6                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 14.0                                                                              | 63.0                                                                              | 22.0                                                                              | 22.0                                                                              | 34.0                                                                              | 43.0                                                                              |                                                                                     | 49.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 4.1                                                                               | 2.0                                                                               | 8.1                                                                               | 10.7                                                                              | 23.7                                                                              | 30.8                                                                              |                                                                                     | 39.8                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 12.0                                                                              | 0.3                                                                               | 0.4                                                                               | 1.2                                                                               | 6.8                                                                               |                                                                                     | 1.8                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 32.1                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



---

## **APPENDIX C**

### **LEVEL OF SERVICE CALCULATIONS**

- Base Year 2022 PM Peak
-

# HCM 2010 Signalized Intersection Summary

## 1: Napilihau Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 55                                                                                | 25                                                                                | 370                                                                               | 60                                                                                | 25                                                                                | 5                                                                                 | 380                                                                                | 215                                                                                 | 65                                                                                  | 10                                                                                  | 280                                                                                 | 75                                                                                  |
| Future Volume (veh/h)        | 55                                                                                | 25                                                                                | 370                                                                               | 60                                                                                | 25                                                                                | 5                                                                                 | 380                                                                                | 215                                                                                 | 65                                                                                  | 10                                                                                  | 280                                                                                 | 75                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                  | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 60                                                                                | 27                                                                                | 24                                                                                | 65                                                                                | 27                                                                                | 1                                                                                 | 413                                                                                | 234                                                                                 | 45                                                                                  | 11                                                                                  | 304                                                                                 | 20                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 232                                                                               | 72                                                                                | 184                                                                               | 236                                                                               | 207                                                                               | 8                                                                                 | 501                                                                                | 1013                                                                                | 861                                                                                 | 15                                                                                  | 503                                                                                 | 428                                                                                 |
| Arrive On Green              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.28                                                                               | 0.54                                                                                | 0.54                                                                                | 0.01                                                                                | 0.27                                                                                | 0.27                                                                                |
| Sat Flow, veh/h              | 912                                                                               | 622                                                                               | 1583                                                                              | 1348                                                                              | 1785                                                                              | 66                                                                                | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 87                                                                                | 0                                                                                 | 24                                                                                | 65                                                                                | 0                                                                                 | 28                                                                                | 413                                                                                | 234                                                                                 | 45                                                                                  | 11                                                                                  | 304                                                                                 | 20                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1534                                                                              | 0                                                                                 | 1583                                                                              | 1348                                                                              | 0                                                                                 | 1851                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 1.8                                                                               | 0.0                                                                               | 0.7                                                                               | 2.3                                                                               | 0.0                                                                               | 0.7                                                                               | 10.5                                                                               | 3.2                                                                                 | 0.6                                                                                 | 0.3                                                                                 | 6.9                                                                                 | 0.5                                                                                 |
| Cycle Q Clear(g_c), s        | 2.5                                                                               | 0.0                                                                               | 0.7                                                                               | 4.8                                                                               | 0.0                                                                               | 0.7                                                                               | 10.5                                                                               | 3.2                                                                                 | 0.6                                                                                 | 0.3                                                                                 | 6.9                                                                                 | 0.5                                                                                 |
| Prop In Lane                 | 0.69                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.04                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 304                                                                               | 0                                                                                 | 184                                                                               | 236                                                                               | 0                                                                                 | 215                                                                               | 501                                                                                | 1013                                                                                | 861                                                                                 | 15                                                                                  | 503                                                                                 | 428                                                                                 |
| V/C Ratio(X)                 | 0.29                                                                              | 0.00                                                                              | 0.13                                                                              | 0.28                                                                              | 0.00                                                                              | 0.13                                                                              | 0.82                                                                               | 0.23                                                                                | 0.05                                                                                | 0.73                                                                                | 0.60                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h        | 874                                                                               | 0                                                                                 | 787                                                                               | 749                                                                               | 0                                                                                 | 920                                                                               | 1102                                                                               | 3046                                                                                | 2590                                                                                | 551                                                                                 | 2468                                                                                | 2098                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 19.9                                                                              | 0.0                                                                               | 19.2                                                                              | 22.2                                                                              | 0.0                                                                               | 19.2                                                                              | 16.2                                                                               | 5.7                                                                                 | 5.2                                                                                 | 23.9                                                                                | 15.4                                                                                | 13.0                                                                                |
| Incr Delay (d2), s/veh       | 0.5                                                                               | 0.0                                                                               | 0.3                                                                               | 0.6                                                                               | 0.0                                                                               | 0.3                                                                               | 3.5                                                                                | 0.2                                                                                 | 0.1                                                                                 | 49.1                                                                                | 2.5                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.1                                                                               | 0.0                                                                               | 0.3                                                                               | 0.9                                                                               | 0.0                                                                               | 0.4                                                                               | 5.5                                                                                | 1.7                                                                                 | 0.3                                                                                 | 0.3                                                                                 | 3.8                                                                                 | 0.2                                                                                 |
| LnGrp Delay(d),s/veh         | 20.4                                                                              | 0.0                                                                               | 19.5                                                                              | 22.8                                                                              | 0.0                                                                               | 19.4                                                                              | 19.7                                                                               | 6.0                                                                                 | 5.2                                                                                 | 73.0                                                                                | 17.9                                                                                | 13.1                                                                                |
| LnGrp LOS                    | C                                                                                 |                                                                                   | B                                                                                 | C                                                                                 |                                                                                   | B                                                                                 | B                                                                                  | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 111                                                                               |                                                                                   |                                                                                   | 93                                                                                |                                                                                   |                                                                                    | 692                                                                                 |                                                                                     |                                                                                     | 335                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 20.2                                                                              |                                                                                   |                                                                                   | 21.8                                                                              |                                                                                   |                                                                                    | 14.1                                                                                |                                                                                     |                                                                                     | 19.4                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.4                                                                               | 32.3                                                                              |                                                                                   | 10.6                                                                              | 18.6                                                                              | 19.0                                                                              |                                                                                    | 10.6                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 79.0                                                                              |                                                                                   | 24.0                                                                              | 30.0                                                                              | 64.0                                                                              |                                                                                    | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.3                                                                               | 5.2                                                                               |                                                                                   | 4.5                                                                               | 12.5                                                                              | 8.9                                                                               |                                                                                    | 6.8                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 3.4                                                                               |                                                                                   | 0.5                                                                               | 1.2                                                                               | 4.2                                                                               |                                                                                    | 0.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 16.7                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## HCM 2010 Signalized Intersection Summary 2: Hoohui Road

08/09/2017

|                              |  |      |      |      |      |      |      |      |      |      |      |      |
|------------------------------|------------------------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Movement                     | EBL                                                                                | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations          |                                                                                    | ↩    | ↩    | ↩    | ↩    |      | ↩    | ↩    | ↩    | ↩    | ↩    | ↩    |
| Traffic Volume (veh/h)       | 75                                                                                 | 20   | 150  | 45   | 15   | 10   | 195  | 585  | 45   | 25   | 570  | 80   |
| Future Volume (veh/h)        | 75                                                                                 | 20   | 150  | 45   | 15   | 10   | 195  | 585  | 45   | 25   | 570  | 80   |
| Number                       | 7                                                                                  | 4    | 14   | 3    | 8    | 18   | 5    | 2    | 12   | 1    | 6    | 16   |
| Initial Q (Qb), veh          | 0                                                                                  | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                               |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Parking Bus, Adj             | 1.00                                                                               | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln       | 1900                                                                               | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h         | 82                                                                                 | 22   | 14   | 49   | 16   | 1    | 212  | 636  | 0    | 27   | 620  | 44   |
| Adj No. of Lanes             | 0                                                                                  | 1    | 1    | 1    | 1    | 0    | 1    | 1    | 1    | 1    | 1    | 1    |
| Peak Hour Factor             | 0.92                                                                               | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, %         | 2                                                                                  | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |
| Cap, veh/h                   | 275                                                                                | 55   | 207  | 243  | 227  | 14   | 447  | 960  | 816  | 392  | 802  | 679  |
| Arrive On Green              | 0.13                                                                               | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.10 | 0.52 | 0.00 | 0.02 | 0.43 | 0.43 |
| Sat Flow, veh/h              | 1075                                                                               | 422  | 1583 | 1367 | 1735 | 108  | 1774 | 1863 | 1583 | 1774 | 1863 | 1576 |
| Grp Volume(v), veh/h         | 104                                                                                | 0    | 14   | 49   | 0    | 17   | 212  | 636  | 0    | 27   | 620  | 44   |
| Grp Sat Flow(s),veh/h/ln     | 1497                                                                               | 0    | 1583 | 1367 | 0    | 1844 | 1774 | 1863 | 1583 | 1774 | 1863 | 1576 |
| Q Serve(g_s), s              | 2.6                                                                                | 0.0  | 0.4  | 1.7  | 0.0  | 0.4  | 2.9  | 12.0 | 0.0  | 0.4  | 13.6 | 0.8  |
| Cycle Q Clear(g_c), s        | 3.0                                                                                | 0.0  | 0.4  | 4.7  | 0.0  | 0.4  | 2.9  | 12.0 | 0.0  | 0.4  | 13.6 | 0.8  |
| Prop In Lane                 | 0.79                                                                               |      | 1.00 | 1.00 |      | 0.06 | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Lane Grp Cap(c), veh/h       | 330                                                                                | 0    | 207  | 243  | 0    | 241  | 447  | 960  | 816  | 392  | 802  | 679  |
| V/C Ratio(X)                 | 0.31                                                                               | 0.00 | 0.07 | 0.20 | 0.00 | 0.07 | 0.47 | 0.66 | 0.00 | 0.07 | 0.77 | 0.06 |
| Avail Cap(c_a), veh/h        | 907                                                                                | 0    | 828  | 779  | 0    | 964  | 820  | 1988 | 1689 | 916  | 1988 | 1682 |
| HCM Platoon Ratio            | 1.00                                                                               | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I)           | 1.00                                                                               | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh     | 19.3                                                                               | 0.0  | 18.2 | 21.6 | 0.0  | 18.2 | 8.4  | 8.5  | 0.0  | 8.0  | 11.6 | 8.0  |
| Incr Delay (d2), s/veh       | 0.5                                                                                | 0.0  | 0.1  | 0.4  | 0.0  | 0.1  | 0.8  | 0.8  | 0.0  | 0.1  | 1.6  | 0.0  |
| Initial Q Delay(d3),s/veh    | 0.0                                                                                | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln     | 1.3                                                                                | 0.0  | 0.2  | 0.7  | 0.0  | 0.2  | 1.5  | 6.2  | 0.0  | 0.2  | 7.3  | 0.3  |
| LnGrp Delay(d),s/veh         | 19.9                                                                               | 0.0  | 18.4 | 22.0 | 0.0  | 18.3 | 9.2  | 9.3  | 0.0  | 8.1  | 13.2 | 8.0  |
| LnGrp LOS                    | B                                                                                  |      | B    | C    |      | B    | A    | A    |      | A    | B    | A    |
| Approach Vol, veh/h          |                                                                                    | 118  |      |      | 66   |      |      | 848  |      |      | 691  |      |
| Approach Delay, s/veh        |                                                                                    | 19.7 |      |      | 21.0 |      |      | 9.3  |      |      | 12.7 |      |
| Approach LOS                 |                                                                                    | B    |      |      | C    |      |      | A    |      |      | B    |      |
| Timer                        | 1                                                                                  | 2    | 3    | 4    | 5    | 6    | 7    | 8    |      |      |      |      |
| Assigned Phs                 | 1                                                                                  | 2    |      | 4    | 5    | 6    |      | 8    |      |      |      |      |
| Phs Duration (G+Y+Rc), s     | 5.9                                                                                | 30.6 |      | 11.2 | 10.0 | 26.6 |      | 11.2 |      |      |      |      |
| Change Period (Y+Rc), s      | 5.0                                                                                | 6.0  |      | 5.0  | 5.0  | 6.0  |      | 5.0  |      |      |      |      |
| Max Green Setting (Gmax), s  | 15.0                                                                               | 51.0 |      | 25.0 | 15.0 | 51.0 |      | 25.0 |      |      |      |      |
| Max Q Clear Time (g_c+I1), s | 2.4                                                                                | 14.0 |      | 5.0  | 4.9  | 15.6 |      | 6.7  |      |      |      |      |
| Green Ext Time (p_c), s      | 0.0                                                                                | 4.7  |      | 0.5  | 0.4  | 4.7  |      | 0.2  |      |      |      |      |
| <b>Intersection Summary</b>  |                                                                                    |      |      |      |      |      |      |      |      |      |      |      |
| HCM 2010 Ctrl Delay          |                                                                                    |      | 11.8 |      |      |      |      |      |      |      |      |      |
| HCM 2010 LOS                 |                                                                                    |      | B    |      |      |      |      |      |      |      |      |      |

# HCM 2010 Signalized Intersection Summary

## 3: Honoapiilani Highway & Akahele Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 60                                                                                | 5                                                                                 | 95                                                                                | 10                                                                                | 5                                                                                 | 10                                                                                | 165                                                                                | 815                                                                                 | 10                                                                                  | 5                                                                                   | 765                                                                                 | 75                                                                                  |
| Future Volume (veh/h)        | 60                                                                                | 5                                                                                 | 95                                                                                | 10                                                                                | 5                                                                                 | 10                                                                                | 165                                                                                | 815                                                                                 | 10                                                                                  | 5                                                                                   | 765                                                                                 | 75                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                  | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 65                                                                                | 5                                                                                 | 4                                                                                 | 11                                                                                | 5                                                                                 | 1                                                                                 | 179                                                                                | 886                                                                                 | 8                                                                                   | 5                                                                                   | 832                                                                                 | 44                                                                                  |
| Adj No. of Lanes             | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 85                                                                                | 113                                                                               | 91                                                                                | 19                                                                                | 154                                                                               | 127                                                                               | 221                                                                                | 1168                                                                                | 993                                                                                 | 7                                                                                   | 943                                                                                 | 800                                                                                 |
| Arrive On Green              | 0.05                                                                              | 0.12                                                                              | 0.12                                                                              | 0.01                                                                              | 0.08                                                                              | 0.08                                                                              | 0.12                                                                               | 0.63                                                                                | 0.63                                                                                | 0.00                                                                                | 0.51                                                                                | 0.51                                                                                |
| Sat Flow, veh/h              | 1774                                                                              | 946                                                                               | 757                                                                               | 1774                                                                              | 1863                                                                              | 1537                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1580                                                                                |
| Grp Volume(v), veh/h         | 65                                                                                | 0                                                                                 | 9                                                                                 | 11                                                                                | 5                                                                                 | 1                                                                                 | 179                                                                                | 886                                                                                 | 8                                                                                   | 5                                                                                   | 832                                                                                 | 44                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1774                                                                              | 0                                                                                 | 1702                                                                              | 1774                                                                              | 1863                                                                              | 1537                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1580                                                                                |
| Q Serve(g_s), s              | 3.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.5                                                                               | 0.2                                                                               | 0.1                                                                               | 8.2                                                                                | 28.4                                                                                | 0.2                                                                                 | 0.2                                                                                 | 33.5                                                                                | 1.2                                                                                 |
| Cycle Q Clear(g_c), s        | 3.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.5                                                                               | 0.2                                                                               | 0.1                                                                               | 8.2                                                                                | 28.4                                                                                | 0.2                                                                                 | 0.2                                                                                 | 33.5                                                                                | 1.2                                                                                 |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 0.44                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 85                                                                                | 0                                                                                 | 204                                                                               | 19                                                                                | 154                                                                               | 127                                                                               | 221                                                                                | 1168                                                                                | 993                                                                                 | 7                                                                                   | 943                                                                                 | 800                                                                                 |
| V/C Ratio(X)                 | 0.77                                                                              | 0.00                                                                              | 0.04                                                                              | 0.58                                                                              | 0.03                                                                              | 0.01                                                                              | 0.81                                                                               | 0.76                                                                                | 0.01                                                                                | 0.72                                                                                | 0.88                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h        | 423                                                                               | 0                                                                                 | 426                                                                               | 423                                                                               | 466                                                                               | 384                                                                               | 528                                                                                | 1442                                                                                | 1226                                                                                | 528                                                                                 | 1442                                                                                | 1223                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 39.5                                                                              | 0.0                                                                               | 32.7                                                                              | 41.3                                                                              | 35.4                                                                              | 35.3                                                                              | 35.8                                                                               | 11.1                                                                                | 5.9                                                                                 | 41.8                                                                                | 18.5                                                                                | 10.5                                                                                |
| Incr Delay (d2), s/veh       | 13.4                                                                              | 0.0                                                                               | 0.1                                                                               | 24.4                                                                              | 0.1                                                                               | 0.0                                                                               | 6.9                                                                                | 1.9                                                                                 | 0.0                                                                                 | 84.7                                                                                | 4.4                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.8                                                                               | 0.0                                                                               | 0.2                                                                               | 0.4                                                                               | 0.1                                                                               | 0.0                                                                               | 4.5                                                                                | 14.9                                                                                | 0.1                                                                                 | 0.3                                                                                 | 18.3                                                                                | 0.5                                                                                 |
| LnGrp Delay(d),s/veh         | 52.9                                                                              | 0.0                                                                               | 32.8                                                                              | 65.8                                                                              | 35.5                                                                              | 35.4                                                                              | 42.6                                                                               | 13.0                                                                                | 5.9                                                                                 | 126.5                                                                               | 22.9                                                                                | 10.6                                                                                |
| LnGrp LOS                    | D                                                                                 |                                                                                   | C                                                                                 | E                                                                                 | D                                                                                 | D                                                                                 | D                                                                                  | B                                                                                   | A                                                                                   | F                                                                                   | C                                                                                   | B                                                                                   |
| Approach Vol, veh/h          | 74                                                                                |                                                                                   |                                                                                   | 17                                                                                |                                                                                   |                                                                                   | 1073                                                                               |                                                                                     |                                                                                     | 881                                                                                 |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 50.4                                                                              |                                                                                   |                                                                                   | 55.1                                                                              |                                                                                   |                                                                                   | 17.9                                                                               |                                                                                     |                                                                                     | 22.9                                                                                |                                                                                     |                                                                                     |
| Approach LOS                 | D                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | B                                                                                  |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.3                                                                               | 57.7                                                                              | 5.9                                                                               | 15.1                                                                              | 15.5                                                                              | 47.5                                                                              | 9.0                                                                                | 12.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              | 25.0                                                                              | 65.0                                                                              | 20.0                                                                               | 21.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.2                                                                               | 30.4                                                                              | 2.5                                                                               | 2.4                                                                               | 10.2                                                                              | 35.5                                                                              | 5.0                                                                                | 2.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 8.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 7.1                                                                               | 0.1                                                                                | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          | 21.5                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 4: Honoapiilani Highway & Lower Honoapiilani Road

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 75                                                                                | 5                                                                                 | 600                                                                               | 80                                                                                | 10                                                                                | 10                                                                                | 605                                                                                 | 880                                                                                 | 10                                                                                  | 5                                                                                   | 810                                                                                 | 20                                                                                  |
| Future Volume (veh/h)        | 75                                                                                | 5                                                                                 | 600                                                                               | 80                                                                                | 10                                                                                | 10                                                                                | 605                                                                                 | 880                                                                                 | 10                                                                                  | 5                                                                                   | 810                                                                                 | 20                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 82                                                                                | 5                                                                                 | 0                                                                                 | 87                                                                                | 11                                                                                | 9                                                                                 | 658                                                                                 | 957                                                                                 | 11                                                                                  | 5                                                                                   | 880                                                                                 | 6                                                                                   |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 203                                                                               | 8                                                                                 | 139                                                                               | 186                                                                               | 15                                                                                | 12                                                                                | 702                                                                                 | 2681                                                                                | 31                                                                                  | 7                                                                                   | 1260                                                                                | 564                                                                                 |
| Arrive On Green              | 0.10                                                                              | 0.09                                                                              | 0.00                                                                              | 0.10                                                                              | 0.09                                                                              | 0.09                                                                              | 0.40                                                                                | 0.75                                                                                | 0.75                                                                                | 0.00                                                                                | 0.36                                                                                | 0.36                                                                                |
| Sat Flow, veh/h              | 1461                                                                              | 89                                                                                | 1583                                                                              | 1320                                                                              | 167                                                                               | 137                                                                               | 1774                                                                                | 3584                                                                                | 41                                                                                  | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 87                                                                                | 0                                                                                 | 0                                                                                 | 107                                                                               | 0                                                                                 | 0                                                                                 | 658                                                                                 | 473                                                                                 | 495                                                                                 | 5                                                                                   | 880                                                                                 | 6                                                                                   |
| Grp Sat Flow(s),veh/h/ln     | 1550                                                                              | 0                                                                                 | 1583                                                                              | 1623                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1855                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 33.4                                                                                | 8.6                                                                                 | 8.6                                                                                 | 0.3                                                                                 | 20.0                                                                                | 0.2                                                                                 |
| Cycle Q Clear(g_c), s        | 4.7                                                                               | 0.0                                                                               | 0.0                                                                               | 5.5                                                                               | 0.0                                                                               | 0.0                                                                               | 33.4                                                                                | 8.6                                                                                 | 8.6                                                                                 | 0.3                                                                                 | 20.0                                                                                | 0.2                                                                                 |
| Prop In Lane                 | 0.94                                                                              |                                                                                   | 1.00                                                                              | 0.81                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                                |                                                                                     | 0.02                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 228                                                                               | 0                                                                                 | 139                                                                               | 230                                                                               | 0                                                                                 | 0                                                                                 | 702                                                                                 | 1324                                                                                | 1388                                                                                | 7                                                                                   | 1260                                                                                | 564                                                                                 |
| V/C Ratio(X)                 | 0.38                                                                              | 0.00                                                                              | 0.00                                                                              | 0.47                                                                              | 0.00                                                                              | 0.00                                                                              | 0.94                                                                                | 0.36                                                                                | 0.36                                                                                | 0.72                                                                                | 0.70                                                                                | 0.01                                                                                |
| Avail Cap(c_a), veh/h        | 404                                                                               | 0                                                                                 | 338                                                                               | 490                                                                               | 0                                                                                 | 0                                                                                 | 1345                                                                                | 1324                                                                                | 1388                                                                                | 1345                                                                                | 2607                                                                                | 1166                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 40.7                                                                              | 0.0                                                                               | 0.0                                                                               | 41.0                                                                              | 0.0                                                                               | 0.0                                                                               | 27.2                                                                                | 4.1                                                                                 | 4.1                                                                                 | 46.6                                                                                | 25.8                                                                                | 19.5                                                                                |
| Incr Delay (d2), s/veh       | 1.1                                                                               | 0.0                                                                               | 0.0                                                                               | 1.5                                                                               | 0.0                                                                               | 0.0                                                                               | 2.8                                                                                 | 0.3                                                                                 | 0.3                                                                                 | 40.7                                                                                | 1.5                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 2.2                                                                               | 0.0                                                                               | 0.0                                                                               | 2.7                                                                               | 0.0                                                                               | 0.0                                                                               | 16.8                                                                                | 4.2                                                                                 | 4.4                                                                                 | 0.2                                                                                 | 10.0                                                                                | 0.1                                                                                 |
| LnGrp Delay(d),s/veh         | 41.7                                                                              | 0.0                                                                               | 0.0                                                                               | 42.5                                                                              | 0.0                                                                               | 0.0                                                                               | 30.0                                                                                | 4.4                                                                                 | 4.4                                                                                 | 87.3                                                                                | 27.4                                                                                | 19.5                                                                                |
| LnGrp LOS                    | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | C                                                                                   | A                                                                                   | A                                                                                   | F                                                                                   | C                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 87                                                                                |                                                                                   |                                                                                   | 107                                                                               |                                                                                   |                                                                                     | 1626                                                                                |                                                                                     |                                                                                     | 891                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 41.7                                                                              |                                                                                   |                                                                                   | 42.5                                                                              |                                                                                   |                                                                                     | 14.8                                                                                |                                                                                     |                                                                                     | 27.6                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 41.1                                                                              | 39.4                                                                              |                                                                                   | 13.2                                                                              | 4.4                                                                               | 76.1                                                                              |                                                                                     | 13.2                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 71.0                                                                              | 69.0                                                                              |                                                                                   | 25.0                                                                              | 71.0                                                                              | 69.0                                                                              |                                                                                     | 20.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 35.4                                                                              | 22.0                                                                              |                                                                                   | 7.5                                                                               | 2.3                                                                               | 10.6                                                                              |                                                                                     | 6.7                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 1.7                                                                               | 11.4                                                                              |                                                                                   | 0.3                                                                               | 0.0                                                                               | 12.2                                                                              |                                                                                     | 0.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 20.9                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 5: Honoapiilani Highway & Halawai Drive

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 50                                                                                | 5                                                                                 | 140                                                                               | 15                                                                                | 0                                                                                 | 5                                                                                 | 135                                                                                 | 1435                                                                                | 10                                                                                  | 10                                                                                  | 1485                                                                                | 60                                                                                  |
| Future Volume (veh/h)        | 50                                                                                | 5                                                                                 | 140                                                                               | 15                                                                                | 0                                                                                 | 5                                                                                 | 135                                                                                 | 1435                                                                                | 10                                                                                  | 10                                                                                  | 1485                                                                                | 60                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.97                                                                              |                                                                                   | 0.96                                                                              | 0.97                                                                              |                                                                                   | 0.96                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 54                                                                                | 5                                                                                 | 6                                                                                 | 16                                                                                | 0                                                                                 | 1                                                                                 | 147                                                                                 | 1560                                                                                | 11                                                                                  | 11                                                                                  | 1614                                                                                | 38                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 230                                                                               | 18                                                                                | 174                                                                               | 187                                                                               | 2                                                                                 | 7                                                                                 | 180                                                                                 | 2613                                                                                | 18                                                                                  | 14                                                                                  | 2236                                                                                | 1000                                                                                |
| Arrive On Green              | 0.13                                                                              | 0.11                                                                              | 0.11                                                                              | 0.13                                                                              | 0.00                                                                              | 0.11                                                                              | 0.10                                                                                | 0.73                                                                                | 0.73                                                                                | 0.01                                                                                | 0.63                                                                                | 0.63                                                                                |
| Sat Flow, veh/h              | 1353                                                                              | 155                                                                               | 1521                                                                              | 968                                                                               | 19                                                                                | 62                                                                                | 1774                                                                                | 3602                                                                                | 25                                                                                  | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 59                                                                                | 0                                                                                 | 6                                                                                 | 17                                                                                | 0                                                                                 | 0                                                                                 | 147                                                                                 | 766                                                                                 | 805                                                                                 | 11                                                                                  | 1614                                                                                | 38                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1509                                                                              | 0                                                                                 | 1521                                                                              | 1049                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1858                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.3                                                                               | 0.9                                                                               | 0.0                                                                               | 0.0                                                                               | 7.5                                                                                 | 19.3                                                                                | 19.3                                                                                | 0.6                                                                                 | 28.4                                                                                | 0.8                                                                                 |
| Cycle Q Clear(g_c), s        | 2.8                                                                               | 0.0                                                                               | 0.3                                                                               | 3.7                                                                               | 0.0                                                                               | 0.0                                                                               | 7.5                                                                                 | 19.3                                                                                | 19.3                                                                                | 0.6                                                                                 | 28.4                                                                                | 0.8                                                                                 |
| Prop In Lane                 | 0.92                                                                              |                                                                                   | 1.00                                                                              | 0.94                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                                |                                                                                     | 0.01                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 264                                                                               | 0                                                                                 | 174                                                                               | 207                                                                               | 0                                                                                 | 0                                                                                 | 180                                                                                 | 1283                                                                                | 1348                                                                                | 14                                                                                  | 2236                                                                                | 1000                                                                                |
| V/C Ratio(X)                 | 0.22                                                                              | 0.00                                                                              | 0.03                                                                              | 0.08                                                                              | 0.00                                                                              | 0.00                                                                              | 0.82                                                                                | 0.60                                                                                | 0.60                                                                                | 0.78                                                                                | 0.72                                                                                | 0.04                                                                                |
| Avail Cap(c_a), veh/h        | 454                                                                               | 0                                                                                 | 381                                                                               | 393                                                                               | 0                                                                                 | 0                                                                                 | 406                                                                                 | 1657                                                                                | 1740                                                                                | 212                                                                                 | 2929                                                                                | 1310                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 36.8                                                                              | 0.0                                                                               | 36.2                                                                              | 38.0                                                                              | 0.0                                                                               | 0.0                                                                               | 40.4                                                                                | 6.1                                                                                 | 6.1                                                                                 | 45.5                                                                                | 11.4                                                                                | 6.4                                                                                 |
| Incr Delay (d2), s/veh       | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 3.4                                                                                 | 1.0                                                                                 | 0.9                                                                                 | 27.6                                                                                | 1.1                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.4                                                                               | 0.0                                                                               | 0.1                                                                               | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 3.8                                                                                 | 9.5                                                                                 | 10.0                                                                                | 0.4                                                                                 | 14.0                                                                                | 0.4                                                                                 |
| LnGrp Delay(d),s/veh         | 37.0                                                                              | 0.0                                                                               | 36.2                                                                              | 38.1                                                                              | 0.0                                                                               | 0.0                                                                               | 43.8                                                                                | 7.1                                                                                 | 7.0                                                                                 | 73.1                                                                                | 12.5                                                                                | 6.4                                                                                 |
| LnGrp LOS                    | D                                                                                 |                                                                                   | D                                                                                 | D                                                                                 |                                                                                   |                                                                                   | D                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 65                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 17                                                                                |                                                                                     | 1718                                                                                |                                                                                     | 1663                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 36.9                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 38.1                                                                              |                                                                                     | 10.2                                                                                |                                                                                     | 12.8                                                                                |                                                                                     |                                                                                     |
| Approach LOS                 | D                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                     | B                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 4                                                                                 |                                                                                   | 5                                                                                 | 6                                                                                 | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 13.3                                                                              | 63.0                                                                              | 15.5                                                                              |                                                                                   | 4.7                                                                               | 71.6                                                                              | 15.5                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   | 4.0                                                                               | 5.0                                                                               | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 21.0                                                                              | 76.0                                                                              | 23.0                                                                              |                                                                                   | 11.0                                                                              | 86.0                                                                              | 23.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 9.5                                                                               | 30.4                                                                              | 5.7                                                                               |                                                                                   | 2.6                                                                               | 21.3                                                                              | 4.8                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.1                                                                               | 27.7                                                                              | 0.0                                                                               |                                                                                   | 0.0                                                                               | 29.8                                                                              | 0.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          | 12.1                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

HCM 2010 Signalized Intersection Summary  
6: Honoapiilani Highway & Kai Ala Drive/Puukolii Road

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 75                                                                                | 5                                                                                 | 175                                                                               | 70                                                                                | 5                                                                                 | 45                                                                                | 125                                                                                | 1425                                                                                | 60                                                                                  | 35                                                                                  | 1645                                                                                | 95                                                                                  |
| Future Volume (veh/h)        | 75                                                                                | 5                                                                                 | 175                                                                               | 70                                                                                | 5                                                                                 | 45                                                                                | 125                                                                                | 1425                                                                                | 60                                                                                  | 35                                                                                  | 1645                                                                                | 95                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.99                                                                              | 0.99                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 82                                                                                | 5                                                                                 | 27                                                                                | 76                                                                                | 5                                                                                 | 1                                                                                 | 136                                                                                | 1549                                                                                | 49                                                                                  | 38                                                                                  | 1788                                                                                | 81                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 2                                                                                   | 1                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 212                                                                               | 12                                                                                | 205                                                                               | 142                                                                               | 197                                                                               | 39                                                                                | 157                                                                                | 2656                                                                                | 1187                                                                                | 49                                                                                  | 2440                                                                                | 1091                                                                                |
| Arrive On Green              | 0.14                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.09                                                                               | 0.75                                                                                | 0.75                                                                                | 0.03                                                                                | 0.69                                                                                | 0.69                                                                                |
| Sat Flow, veh/h              | 1298                                                                              | 89                                                                                | 1562                                                                              | 1358                                                                              | 1504                                                                              | 301                                                                               | 1774                                                                               | 3539                                                                                | 1582                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 87                                                                                | 0                                                                                 | 27                                                                                | 76                                                                                | 0                                                                                 | 6                                                                                 | 136                                                                                | 1549                                                                                | 49                                                                                  | 38                                                                                  | 1788                                                                                | 81                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1387                                                                              | 0                                                                                 | 1562                                                                              | 1358                                                                              | 0                                                                                 | 1805                                                                              | 1774                                                                               | 1770                                                                                | 1582                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 9.2                                                                               | 0.0                                                                               | 2.5                                                                               | 9.1                                                                               | 0.0                                                                               | 0.5                                                                               | 12.5                                                                               | 32.1                                                                                | 1.3                                                                                 | 3.5                                                                                 | 52.3                                                                                | 2.8                                                                                 |
| Cycle Q Clear(g_c), s        | 9.7                                                                               | 0.0                                                                               | 2.5                                                                               | 18.8                                                                              | 0.0                                                                               | 0.5                                                                               | 12.5                                                                               | 32.1                                                                                | 1.3                                                                                 | 3.5                                                                                 | 52.3                                                                                | 2.8                                                                                 |
| Prop In Lane                 | 0.94                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.17                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 233                                                                               | 0                                                                                 | 205                                                                               | 142                                                                               | 0                                                                                 | 237                                                                               | 157                                                                                | 2656                                                                                | 1187                                                                                | 49                                                                                  | 2440                                                                                | 1091                                                                                |
| V/C Ratio(X)                 | 0.37                                                                              | 0.00                                                                              | 0.13                                                                              | 0.54                                                                              | 0.00                                                                              | 0.03                                                                              | 0.86                                                                               | 0.58                                                                                | 0.04                                                                                | 0.78                                                                                | 0.73                                                                                | 0.07                                                                                |
| Avail Cap(c_a), veh/h        | 253                                                                               | 0                                                                                 | 227                                                                               | 161                                                                               | 0                                                                                 | 263                                                                               | 280                                                                                | 2656                                                                                | 1187                                                                                | 108                                                                                 | 2440                                                                                | 1091                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.71                                                                               | 0.71                                                                                | 0.71                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 66.2                                                                              | 0.0                                                                               | 63.4                                                                              | 75.2                                                                              | 0.0                                                                               | 62.5                                                                              | 74.2                                                                               | 9.1                                                                                 | 5.3                                                                                 | 79.7                                                                                | 16.1                                                                                | 8.4                                                                                 |
| Incr Delay (d2), s/veh       | 1.0                                                                               | 0.0                                                                               | 0.3                                                                               | 3.1                                                                               | 0.0                                                                               | 0.0                                                                               | 3.9                                                                                | 0.7                                                                                 | 0.0                                                                                 | 9.3                                                                                 | 2.0                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 3.7                                                                               | 0.0                                                                               | 1.1                                                                               | 3.5                                                                               | 0.0                                                                               | 0.2                                                                               | 6.3                                                                                | 15.7                                                                                | 0.6                                                                                 | 1.8                                                                                 | 26.0                                                                                | 1.3                                                                                 |
| LnGrp Delay(d),s/veh         | 67.2                                                                              | 0.0                                                                               | 63.7                                                                              | 78.4                                                                              | 0.0                                                                               | 62.5                                                                              | 78.1                                                                               | 9.8                                                                                 | 5.4                                                                                 | 89.0                                                                                | 18.1                                                                                | 8.5                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                  | A                                                                                   | A                                                                                   | F                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 114                                                                               |                                                                                   |                                                                                   | 82                                                                                |                                                                                   |                                                                                    | 1734                                                                                |                                                                                     |                                                                                     | 1907                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 66.4                                                                              |                                                                                   |                                                                                   | 77.2                                                                              |                                                                                   |                                                                                    | 15.0                                                                                |                                                                                     |                                                                                     | 19.1                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 18.6                                                                              | 119.7                                                                             |                                                                                   | 26.6                                                                              | 8.6                                                                               | 129.8                                                                             |                                                                                    | 26.6                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 26.0                                                                              | 100.0                                                                             |                                                                                   | 24.0                                                                              | 10.0                                                                              | 116.0                                                                             |                                                                                    | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 14.5                                                                              | 54.3                                                                              |                                                                                   | 20.8                                                                              | 5.5                                                                               | 34.1                                                                              |                                                                                    | 11.7                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.2                                                                               | 32.1                                                                              |                                                                                   | 0.1                                                                               | 0.0                                                                               | 34.5                                                                              |                                                                                    | 0.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 19.9                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 7: Honoapiilani Highway & Kaanapali Parkway/Halelo Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 290                                                                               | 5                                                                                 | 615                                                                               | 15                                                                                | 0                                                                                 | 5                                                                                 | 385                                                                                | 1470                                                                                | 10                                                                                  | 75                                                                                  | 1690                                                                                | 135                                                                                 |
| Future Volume (veh/h)        | 290                                                                               | 5                                                                                 | 615                                                                               | 15                                                                                | 0                                                                                 | 5                                                                                 | 385                                                                                | 1470                                                                                | 10                                                                                  | 75                                                                                  | 1690                                                                                | 135                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 0.96                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 315                                                                               | 5                                                                                 | 469                                                                               | 16                                                                                | 0                                                                                 | 1                                                                                 | 418                                                                                | 1598                                                                                | 11                                                                                  | 82                                                                                  | 1837                                                                                | 109                                                                                 |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 2                                                                                  | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 272                                                                               | 4                                                                                 | 812                                                                               | 69                                                                                | 0                                                                                 | 4                                                                                 | 489                                                                                | 2398                                                                                | 16                                                                                  | 113                                                                                 | 2078                                                                                | 930                                                                                 |
| Arrive On Green              | 0.16                                                                              | 0.16                                                                              | 0.15                                                                              | 0.04                                                                              | 0.00                                                                              | 0.03                                                                              | 0.14                                                                               | 0.67                                                                                | 0.66                                                                                | 0.06                                                                                | 0.59                                                                                | 0.59                                                                                |
| Sat Flow, veh/h              | 1748                                                                              | 28                                                                                | 2750                                                                              | 1653                                                                              | 0                                                                                 | 103                                                                               | 3442                                                                               | 3603                                                                                | 25                                                                                  | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 320                                                                               | 0                                                                                 | 469                                                                               | 17                                                                                | 0                                                                                 | 0                                                                                 | 418                                                                                | 784                                                                                 | 825                                                                                 | 82                                                                                  | 1837                                                                                | 109                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1775                                                                              | 0                                                                                 | 1375                                                                              | 1756                                                                              | 0                                                                                 | 0                                                                                 | 1721                                                                               | 1770                                                                                | 1858                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 34.0                                                                              | 0.0                                                                               | 31.7                                                                              | 2.0                                                                               | 0.0                                                                               | 0.0                                                                               | 25.9                                                                               | 58.1                                                                                | 58.3                                                                                | 9.9                                                                                 | 97.3                                                                                | 6.7                                                                                 |
| Cycle Q Clear(g_c), s        | 34.0                                                                              | 0.0                                                                               | 31.7                                                                              | 2.0                                                                               | 0.0                                                                               | 0.0                                                                               | 25.9                                                                               | 58.1                                                                                | 58.3                                                                                | 9.9                                                                                 | 97.3                                                                                | 6.7                                                                                 |
| Prop In Lane                 | 0.98                                                                              |                                                                                   | 1.00                                                                              | 0.94                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                               |                                                                                     | 0.01                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 276                                                                               | 0                                                                                 | 812                                                                               | 73                                                                                | 0                                                                                 | 0                                                                                 | 489                                                                                | 1178                                                                                | 1237                                                                                | 113                                                                                 | 2078                                                                                | 930                                                                                 |
| V/C Ratio(X)                 | 1.16                                                                              | 0.00                                                                              | 0.58                                                                              | 0.23                                                                              | 0.00                                                                              | 0.00                                                                              | 0.85                                                                               | 0.67                                                                                | 0.67                                                                                | 0.73                                                                                | 0.88                                                                                | 0.12                                                                                |
| Avail Cap(c_a), veh/h        | 276                                                                               | 0                                                                                 | 812                                                                               | 249                                                                               | 0                                                                                 | 0                                                                                 | 914                                                                                | 1572                                                                                | 1651                                                                                | 122                                                                                 | 2447                                                                                | 1095                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 92.2                                                                              | 0.0                                                                               | 65.7                                                                              | 101.3                                                                             | 0.0                                                                               | 0.0                                                                               | 91.5                                                                               | 21.9                                                                                | 22.0                                                                                | 100.3                                                                               | 38.7                                                                                | 20.0                                                                                |
| Incr Delay (d2), s/veh       | 103.6                                                                             | 0.0                                                                               | 0.7                                                                               | 0.6                                                                               | 0.0                                                                               | 0.0                                                                               | 1.7                                                                                | 0.9                                                                                 | 0.9                                                                                 | 14.9                                                                                | 4.0                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 24.6                                                                              | 0.0                                                                               | 12.1                                                                              | 1.0                                                                               | 0.0                                                                               | 0.0                                                                               | 12.5                                                                               | 28.6                                                                                | 30.1                                                                                | 5.3                                                                                 | 48.6                                                                                | 2.9                                                                                 |
| LnGrp Delay(d),s/veh         | 195.8                                                                             | 0.0                                                                               | 66.4                                                                              | 101.9                                                                             | 0.0                                                                               | 0.0                                                                               | 93.1                                                                               | 22.9                                                                                | 22.8                                                                                | 115.3                                                                               | 42.7                                                                                | 20.1                                                                                |
| LnGrp LOS                    | F                                                                                 |                                                                                   | E                                                                                 | F                                                                                 |                                                                                   |                                                                                   | F                                                                                  | C                                                                                   | C                                                                                   | F                                                                                   | D                                                                                   | C                                                                                   |
| Approach Vol, veh/h          | 789                                                                               |                                                                                   |                                                                                   |                                                                                   | 17                                                                                |                                                                                   |                                                                                    | 2027                                                                                |                                                                                     |                                                                                     | 2028                                                                                |                                                                                     |
| Approach Delay, s/veh        | 118.9                                                                             |                                                                                   |                                                                                   |                                                                                   | 101.9                                                                             |                                                                                   |                                                                                    | 37.4                                                                                |                                                                                     |                                                                                     | 44.4                                                                                |                                                                                     |
| Approach LOS                 | F                                                                                 |                                                                                   |                                                                                   |                                                                                   | F                                                                                 |                                                                                   |                                                                                    | D                                                                                   |                                                                                     |                                                                                     | D                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 4                                                                                 |                                                                                   | 5                                                                                 | 6                                                                                 | 8                                                                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 35.0                                                                              | 132.2                                                                             | 13.1                                                                              |                                                                                   | 17.9                                                                              | 149.3                                                                             | 38.0                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 6.0                                                                               | 6.0                                                                               | 7.0                                                                               |                                                                                   | 6.0                                                                               | 6.0                                                                               | 7.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 56.0                                                                              | 149.0                                                                             | 28.0                                                                              |                                                                                   | 13.0                                                                              | 192.0                                                                             | 31.0                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 27.9                                                                              | 99.3                                                                              | 4.0                                                                               |                                                                                   | 11.9                                                                              | 60.3                                                                              | 36.0                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 1.1                                                                               | 26.9                                                                              | 0.0                                                                               |                                                                                   | 0.0                                                                               | 21.4                                                                              | 0.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          | 53.8                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 | D                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 8: Honoapiilani Highway & Leialii Parkway

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |                                                                                     |
| Traffic Volume (veh/h)       | 10                                                                                | 0                                                                                 | 5                                                                                 | 90                                                                                | 5                                                                                 | 60                                                                                | 10                                                                                  | 1805                                                                                | 90                                                                                  | 85                                                                                  | 2250                                                                                | 5                                                                                   |
| Future Volume (veh/h)        | 10                                                                                | 0                                                                                 | 5                                                                                 | 90                                                                                | 5                                                                                 | 60                                                                                | 10                                                                                  | 1805                                                                                | 90                                                                                  | 85                                                                                  | 2250                                                                                | 5                                                                                   |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 11                                                                                | 0                                                                                 | 1                                                                                 | 98                                                                                | 5                                                                                 | 3                                                                                 | 11                                                                                  | 1962                                                                                | 96                                                                                  | 92                                                                                  | 2446                                                                                | 5                                                                                   |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 160                                                                               | 2                                                                                 | 10                                                                                | 182                                                                               | 96                                                                                | 58                                                                                | 22                                                                                  | 2599                                                                                | 126                                                                                 | 118                                                                                 | 2936                                                                                | 6                                                                                   |
| Arrive On Green              | 0.09                                                                              | 0.00                                                                              | 0.08                                                                              | 0.09                                                                              | 0.09                                                                              | 0.08                                                                              | 0.03                                                                                | 1.00                                                                                | 1.00                                                                                | 0.07                                                                                | 0.81                                                                                | 0.80                                                                                |
| Sat Flow, veh/h              | 1235                                                                              | 26                                                                                | 115                                                                               | 1410                                                                              | 1092                                                                              | 655                                                                               | 1774                                                                                | 3436                                                                                | 167                                                                                 | 1774                                                                                | 3624                                                                                | 7                                                                                   |
| Grp Volume(v), veh/h         | 12                                                                                | 0                                                                                 | 0                                                                                 | 98                                                                                | 0                                                                                 | 8                                                                                 | 11                                                                                  | 1003                                                                                | 1055                                                                                | 92                                                                                  | 1194                                                                                | 1257                                                                                |
| Grp Sat Flow(s),veh/h/ln     | 1376                                                                              | 0                                                                                 | 0                                                                                 | 1410                                                                              | 0                                                                                 | 1747                                                                              | 1774                                                                                | 1770                                                                                | 1833                                                                                | 1774                                                                                | 1770                                                                                | 1861                                                                                |
| Q Serve(g_s), s              | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 7.4                                                                               | 0.0                                                                               | 0.6                                                                               | 0.8                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 6.9                                                                                 | 53.1                                                                                | 53.2                                                                                |
| Cycle Q Clear(g_c), s        | 1.4                                                                               | 0.0                                                                               | 0.0                                                                               | 8.8                                                                               | 0.0                                                                               | 0.6                                                                               | 0.8                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 6.9                                                                                 | 53.1                                                                                | 53.2                                                                                |
| Prop In Lane                 | 0.92                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                              |                                                                                   | 0.38                                                                              | 1.00                                                                                |                                                                                     | 0.09                                                                                | 1.00                                                                                |                                                                                     | 0.00                                                                                |
| Lane Grp Cap(c), veh/h       | 173                                                                               | 0                                                                                 | 0                                                                                 | 182                                                                               | 0                                                                                 | 154                                                                               | 22                                                                                  | 1338                                                                                | 1386                                                                                | 118                                                                                 | 1434                                                                                | 1508                                                                                |
| V/C Ratio(X)                 | 0.07                                                                              | 0.00                                                                              | 0.00                                                                              | 0.54                                                                              | 0.00                                                                              | 0.05                                                                              | 0.50                                                                                | 0.75                                                                                | 0.76                                                                                | 0.78                                                                                | 0.83                                                                                | 0.83                                                                                |
| Avail Cap(c_a), veh/h        | 299                                                                               | 0                                                                                 | 0                                                                                 | 308                                                                               | 0                                                                                 | 311                                                                               | 145                                                                                 | 1338                                                                                | 1386                                                                                | 250                                                                                 | 1434                                                                                | 1508                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.60                                                                                | 0.60                                                                                | 0.60                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 56.9                                                                              | 0.0                                                                               | 0.0                                                                               | 60.0                                                                              | 0.0                                                                               | 56.5                                                                              | 65.4                                                                                | 0.0                                                                                 | 0.0                                                                                 | 62.0                                                                                | 7.5                                                                                 | 7.5                                                                                 |
| Incr Delay (d2), s/veh       | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 2.5                                                                               | 0.0                                                                               | 0.1                                                                               | 3.8                                                                                 | 2.4                                                                                 | 2.4                                                                                 | 4.1                                                                                 | 5.8                                                                                 | 5.6                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 3.7                                                                               | 0.0                                                                               | 0.3                                                                               | 0.4                                                                                 | 0.9                                                                                 | 0.9                                                                                 | 3.5                                                                                 | 27.5                                                                                | 29.2                                                                                |
| LnGrp Delay(d),s/veh         | 57.0                                                                              | 0.0                                                                               | 0.0                                                                               | 62.5                                                                              | 0.0                                                                               | 56.7                                                                              | 69.1                                                                                | 2.4                                                                                 | 2.4                                                                                 | 66.2                                                                                | 13.3                                                                                | 13.0                                                                                |
| LnGrp LOS                    | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 12                                                                                |                                                                                   |                                                                                   | 106                                                                               |                                                                                   |                                                                                     | 2069                                                                                |                                                                                     |                                                                                     | 2543                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 57.0                                                                              |                                                                                   |                                                                                   | 62.0                                                                              |                                                                                   |                                                                                     | 2.7                                                                                 |                                                                                     |                                                                                     | 15.1                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.7                                                                               | 113.4                                                                             |                                                                                   | 15.9                                                                              | 13.0                                                                              | 106.1                                                                             |                                                                                     | 15.9                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 11.0                                                                              | 87.0                                                                              |                                                                                   | 23.0                                                                              | 19.0                                                                              | 79.0                                                                              |                                                                                     | 23.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.8                                                                               | 55.2                                                                              |                                                                                   | 10.8                                                                              | 8.9                                                                               | 2.0                                                                               |                                                                                     | 3.4                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 30.1                                                                              |                                                                                   | 0.2                                                                               | 0.1                                                                               | 54.6                                                                              |                                                                                     | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   |                                                                                   | 10.8                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 9: Honoapiilani Highway & Front Street/Flemming Road

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |                                                                                   |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 175                                                                               | 15                                                                                | 10                                                                                | 60                                                                                | 5                                                                                 | 10                                                                                | 5                                                                                   | 1730                                                                                | 20                                                                                  | 5                                                                                   | 1910                                                                                | 325                                                                                 |
| Future Volume (veh/h)        | 175                                                                               | 15                                                                                | 10                                                                                | 60                                                                                | 5                                                                                 | 10                                                                                | 5                                                                                   | 1730                                                                                | 20                                                                                  | 5                                                                                   | 1910                                                                                | 325                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 190                                                                               | 16                                                                                | 9                                                                                 | 65                                                                                | 5                                                                                 | 7                                                                                 | 5                                                                                   | 1880                                                                                | 21                                                                                  | 5                                                                                   | 2076                                                                                | 278                                                                                 |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 0                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 268                                                                               | 18                                                                                | 10                                                                                | 273                                                                               | 22                                                                                | 25                                                                                | 7                                                                                   | 2662                                                                                | 30                                                                                  | 7                                                                                   | 2627                                                                                | 1175                                                                                |
| Arrive On Green              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.01                                                                                | 1.00                                                                                | 1.00                                                                                | 0.00                                                                                | 0.74                                                                                | 0.74                                                                                |
| Sat Flow, veh/h              | 1321                                                                              | 111                                                                               | 63                                                                                | 1358                                                                              | 132                                                                               | 149                                                                               | 1774                                                                                | 3585                                                                                | 40                                                                                  | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 215                                                                               | 0                                                                                 | 0                                                                                 | 77                                                                                | 0                                                                                 | 0                                                                                 | 5                                                                                   | 926                                                                                 | 975                                                                                 | 5                                                                                   | 2076                                                                                | 278                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1495                                                                              | 0                                                                                 | 0                                                                                 | 1639                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1856                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 13.4                                                                              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.4                                                                                 | 49.3                                                                                | 7.4                                                                                 |
| Cycle Q Clear(g_c), s        | 18.8                                                                              | 0.0                                                                               | 0.0                                                                               | 5.4                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.4                                                                                 | 49.3                                                                                | 7.4                                                                                 |
| Prop In Lane                 | 0.88                                                                              |                                                                                   | 0.04                                                                              | 0.84                                                                              |                                                                                   | 0.09                                                                              | 1.00                                                                                |                                                                                     | 0.02                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 297                                                                               | 0                                                                                 | 0                                                                                 | 319                                                                               | 0                                                                                 | 0                                                                                 | 7                                                                                   | 1314                                                                                | 1378                                                                                | 7                                                                                   | 2627                                                                                | 1175                                                                                |
| V/C Ratio(X)                 | 0.72                                                                              | 0.00                                                                              | 0.00                                                                              | 0.24                                                                              | 0.00                                                                              | 0.00                                                                              | 0.74                                                                                | 0.71                                                                                | 0.71                                                                                | 0.74                                                                                | 0.79                                                                                | 0.24                                                                                |
| Avail Cap(c_a), veh/h        | 379                                                                               | 0                                                                                 | 0                                                                                 | 401                                                                               | 0                                                                                 | 0                                                                                 | 105                                                                                 | 1314                                                                                | 1378                                                                                | 105                                                                                 | 2627                                                                                | 1175                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.60                                                                                | 0.60                                                                                | 0.60                                                                                | 0.39                                                                                | 0.39                                                                                | 0.39                                                                                |
| Uniform Delay (d), s/veh     | 54.6                                                                              | 0.0                                                                               | 0.0                                                                               | 49.4                                                                              | 0.0                                                                               | 0.0                                                                               | 66.9                                                                                | 0.0                                                                                 | 0.0                                                                                 | 67.2                                                                                | 10.8                                                                                | 5.4                                                                                 |
| Incr Delay (d2), s/veh       | 4.9                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 29.4                                                                                | 1.9                                                                                 | 1.9                                                                                 | 20.3                                                                                | 1.0                                                                                 | 0.2                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 8.2                                                                               | 0.0                                                                               | 0.0                                                                               | 2.6                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                                 | 0.7                                                                                 | 0.7                                                                                 | 0.2                                                                                 | 24.0                                                                                | 3.2                                                                                 |
| LnGrp Delay(d),s/veh         | 59.5                                                                              | 0.0                                                                               | 0.0                                                                               | 49.7                                                                              | 0.0                                                                               | 0.0                                                                               | 96.3                                                                                | 1.9                                                                                 | 1.9                                                                                 | 87.4                                                                                | 11.8                                                                                | 5.6                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | F                                                                                   | A                                                                                   | A                                                                                   | F                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 215                                                                               |                                                                                   |                                                                                   | 77                                                                                |                                                                                   |                                                                                     | 1906                                                                                |                                                                                     |                                                                                     | 2359                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 59.5                                                                              |                                                                                   |                                                                                   | 49.7                                                                              |                                                                                   |                                                                                     | 2.1                                                                                 |                                                                                     |                                                                                     | 11.3                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 4.5                                                                               | 104.2                                                                             |                                                                                   | 26.3                                                                              | 4.5                                                                               | 104.2                                                                             |                                                                                     | 26.3                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 8.0                                                                               | 84.0                                                                              |                                                                                   | 29.0                                                                              | 8.0                                                                               | 84.0                                                                              |                                                                                     | 29.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.4                                                                               | 51.3                                                                              |                                                                                   | 7.4                                                                               | 2.4                                                                               | 2.0                                                                               |                                                                                     | 20.8                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 30.9                                                                              |                                                                                   | 0.2                                                                               | 0.0                                                                               | 62.7                                                                              |                                                                                     | 0.5                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          | 10.4                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 10: Honoapiilani Highway & Kapunakea Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |                                                                                     |  |  |                                                                                     |
| Traffic Volume (veh/h)       | 180                                                                               | 35                                                                                | 45                                                                                | 95                                                                                | 25                                                                                | 20                                                                                | 55                                                                                 | 1535                                                                                | 105                                                                                 | 25                                                                                  | 1845                                                                                | 150                                                                                 |
| Future Volume (veh/h)        | 180                                                                               | 35                                                                                | 45                                                                                | 95                                                                                | 25                                                                                | 20                                                                                | 55                                                                                 | 1535                                                                                | 105                                                                                 | 25                                                                                  | 1845                                                                                | 150                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                              |                                                                                   | 0.98                                                                              | 0.99                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 196                                                                               | 38                                                                                | 8                                                                                 | 103                                                                               | 27                                                                                | 2                                                                                 | 60                                                                                 | 1668                                                                                | 111                                                                                 | 27                                                                                  | 2005                                                                                | 159                                                                                 |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 268                                                                               | 43                                                                                | 307                                                                               | 355                                                                               | 340                                                                               | 25                                                                                | 76                                                                                 | 2336                                                                                | 154                                                                                 | 34                                                                                  | 2225                                                                                | 174                                                                                 |
| Arrive On Green              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.19                                                                              | 0.09                                                                               | 1.00                                                                                | 1.00                                                                                | 0.04                                                                                | 1.00                                                                                | 1.00                                                                                |
| Sat Flow, veh/h              | 1103                                                                              | 214                                                                               | 1545                                                                              | 1347                                                                              | 1710                                                                              | 127                                                                               | 1774                                                                               | 3370                                                                                | 223                                                                                 | 1774                                                                                | 3325                                                                                | 260                                                                                 |
| Grp Volume(v), veh/h         | 234                                                                               | 0                                                                                 | 8                                                                                 | 103                                                                               | 0                                                                                 | 29                                                                                | 60                                                                                 | 870                                                                                 | 909                                                                                 | 27                                                                                  | 1054                                                                                | 1110                                                                                |
| Grp Sat Flow(s),veh/h/ln     | 1317                                                                              | 0                                                                                 | 1545                                                                              | 1347                                                                              | 0                                                                                 | 1837                                                                              | 1774                                                                               | 1770                                                                                | 1823                                                                                | 1774                                                                                | 1770                                                                                | 1816                                                                                |
| Q Serve(g_s), s              | 21.9                                                                              | 0.0                                                                               | 0.6                                                                               | 0.0                                                                               | 0.0                                                                               | 1.7                                                                               | 4.5                                                                                | 0.0                                                                                 | 0.0                                                                                 | 2.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Cycle Q Clear(g_c), s        | 23.6                                                                              | 0.0                                                                               | 0.6                                                                               | 7.7                                                                               | 0.0                                                                               | 1.7                                                                               | 4.5                                                                                | 0.0                                                                                 | 0.0                                                                                 | 2.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Prop In Lane                 | 0.84                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.07                                                                              | 1.00                                                                               |                                                                                     | 0.12                                                                                | 1.00                                                                                |                                                                                     | 0.14                                                                                |
| Lane Grp Cap(c), veh/h       | 311                                                                               | 0                                                                                 | 307                                                                               | 355                                                                               | 0                                                                                 | 365                                                                               | 76                                                                                 | 1227                                                                                | 1264                                                                                | 34                                                                                  | 1184                                                                                | 1215                                                                                |
| V/C Ratio(X)                 | 0.75                                                                              | 0.00                                                                              | 0.03                                                                              | 0.29                                                                              | 0.00                                                                              | 0.08                                                                              | 0.79                                                                               | 0.71                                                                                | 0.72                                                                                | 0.80                                                                                | 0.89                                                                                | 0.91                                                                                |
| Avail Cap(c_a), veh/h        | 333                                                                               | 0                                                                                 | 332                                                                               | 377                                                                               | 0                                                                                 | 395                                                                               | 105                                                                                | 1227                                                                                | 1264                                                                                | 105                                                                                 | 1184                                                                                | 1215                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 2.00                                                                               | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.38                                                                               | 0.38                                                                                | 0.38                                                                                | 0.50                                                                                | 0.50                                                                                | 0.50                                                                                |
| Uniform Delay (d), s/veh     | 53.6                                                                              | 0.0                                                                               | 43.5                                                                              | 46.4                                                                              | 0.0                                                                               | 44.0                                                                              | 61.1                                                                               | 0.0                                                                                 | 0.0                                                                                 | 64.7                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Incr Delay (d2), s/veh       | 8.7                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.1                                                                               | 6.5                                                                                | 1.3                                                                                 | 1.4                                                                                 | 7.7                                                                                 | 5.5                                                                                 | 6.6                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 9.3                                                                               | 0.0                                                                               | 0.2                                                                               | 3.3                                                                               | 0.0                                                                               | 0.9                                                                               | 2.3                                                                                | 0.5                                                                                 | 0.5                                                                                 | 1.1                                                                                 | 1.8                                                                                 | 2.2                                                                                 |
| LnGrp Delay(d),s/veh         | 62.3                                                                              | 0.0                                                                               | 43.6                                                                              | 46.9                                                                              | 0.0                                                                               | 44.1                                                                              | 67.6                                                                               | 1.3                                                                                 | 1.4                                                                                 | 72.4                                                                                | 5.5                                                                                 | 6.6                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 |                                                                                   | D                                                                                 | E                                                                                  | A                                                                                   | A                                                                                   | E                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 242                                                                               |                                                                                   |                                                                                   | 132                                                                               |                                                                                   |                                                                                    | 1839                                                                                |                                                                                     |                                                                                     | 2191                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 61.7                                                                              |                                                                                   |                                                                                   | 46.3                                                                              |                                                                                   |                                                                                    | 3.5                                                                                 |                                                                                     |                                                                                     | 6.9                                                                                 |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                    | A                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 9.8                                                                               | 94.3                                                                              |                                                                                   | 30.9                                                                              | 6.6                                                                               | 97.6                                                                              |                                                                                    | 30.9                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 8.0                                                                               | 85.0                                                                              |                                                                                   | 28.0                                                                              | 8.0                                                                               | 85.0                                                                              |                                                                                    | 28.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 6.5                                                                               | 2.0                                                                               |                                                                                   | 9.7                                                                               | 4.0                                                                               | 2.0                                                                               |                                                                                    | 25.6                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 62.6                                                                              |                                                                                   | 0.4                                                                               | 0.0                                                                               | 43.1                                                                              |                                                                                    | 0.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 9.7                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 11: Honoapiilani Highway & Keawe Street

08/09/2017

|                              |  |  |  |  |  |   |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                                | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 60                                                                                | 185                                                                               | 60                                                                                | 125                                                                               | 110                                                                               | 695                                                                                | 55                                                                                  | 940                                                                                 | 195                                                                                 | 630                                                                                 | 1225                                                                                | 65                                                                                  |
| Future Volume (veh/h)        | 60                                                                                | 185                                                                               | 60                                                                                | 125                                                                               | 110                                                                               | 695                                                                                | 55                                                                                  | 940                                                                                 | 195                                                                                 | 630                                                                                 | 1225                                                                                | 65                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                 | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                              |                                                                                   | 0.98                                                                               | 1.00                                                                                |                                                                                     | 0.99                                                                                | 1.00                                                                                |                                                                                     | 0.99                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 65                                                                                | 201                                                                               | 8                                                                                 | 136                                                                               | 120                                                                               | 454                                                                                | 60                                                                                  | 1022                                                                                | 128                                                                                 | 685                                                                                 | 1332                                                                                | 69                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                  | 1                                                                                   | 2                                                                                   | 1                                                                                   | 2                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 97                                                                                | 239                                                                               | 317                                                                               | 234                                                                               | 589                                                                               | 492                                                                                | 77                                                                                  | 1361                                                                                | 604                                                                                 | 724                                                                                 | 1887                                                                                | 98                                                                                  |
| Arrive On Green              | 0.21                                                                              | 0.21                                                                              | 0.21                                                                              | 0.08                                                                              | 0.32                                                                              | 0.32                                                                               | 0.04                                                                                | 0.38                                                                                | 0.38                                                                                | 0.42                                                                                | 1.00                                                                                | 1.00                                                                                |
| Sat Flow, veh/h              | 310                                                                               | 1163                                                                              | 1542                                                                              | 1774                                                                              | 1863                                                                              | 1556                                                                               | 1774                                                                                | 3539                                                                                | 1571                                                                                | 3442                                                                                | 3423                                                                                | 177                                                                                 |
| Grp Volume(v), veh/h         | 266                                                                               | 0                                                                                 | 8                                                                                 | 136                                                                               | 120                                                                               | 454                                                                                | 60                                                                                  | 1022                                                                                | 128                                                                                 | 685                                                                                 | 687                                                                                 | 714                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1473                                                                              | 0                                                                                 | 1542                                                                              | 1774                                                                              | 1863                                                                              | 1556                                                                               | 1774                                                                                | 1770                                                                                | 1571                                                                                | 1721                                                                                | 1770                                                                                | 1830                                                                                |
| Q Serve(g_s), s              | 20.4                                                                              | 0.0                                                                               | 0.6                                                                               | 7.8                                                                               | 6.4                                                                               | 38.0                                                                               | 4.5                                                                                 | 33.7                                                                                | 7.4                                                                                 | 25.9                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Cycle Q Clear(g_c), s        | 23.5                                                                              | 0.0                                                                               | 0.6                                                                               | 7.8                                                                               | 6.4                                                                               | 38.0                                                                               | 4.5                                                                                 | 33.7                                                                                | 7.4                                                                                 | 25.9                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Prop In Lane                 | 0.24                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 0.10                                                                                |
| Lane Grp Cap(c), veh/h       | 336                                                                               | 0                                                                                 | 317                                                                               | 234                                                                               | 589                                                                               | 492                                                                                | 77                                                                                  | 1361                                                                                | 604                                                                                 | 724                                                                                 | 976                                                                                 | 1009                                                                                |
| V/C Ratio(X)                 | 0.79                                                                              | 0.00                                                                              | 0.03                                                                              | 0.58                                                                              | 0.20                                                                              | 0.92                                                                               | 0.78                                                                                | 0.75                                                                                | 0.21                                                                                | 0.95                                                                                | 0.70                                                                                | 0.71                                                                                |
| Avail Cap(c_a), veh/h        | 339                                                                               | 0                                                                                 | 320                                                                               | 301                                                                               | 662                                                                               | 553                                                                                | 237                                                                                 | 1361                                                                                | 604                                                                                 | 765                                                                                 | 976                                                                                 | 1009                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 0.88                                                                                | 0.88                                                                                | 0.88                                                                                | 0.31                                                                                | 0.31                                                                                | 0.31                                                                                |
| Uniform Delay (d), s/veh     | 51.6                                                                              | 0.0                                                                               | 42.8                                                                              | 38.4                                                                              | 33.7                                                                              | 44.6                                                                               | 63.9                                                                                | 36.0                                                                                | 27.8                                                                                | 38.4                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Incr Delay (d2), s/veh       | 12.0                                                                              | 0.0                                                                               | 0.0                                                                               | 2.3                                                                               | 0.2                                                                               | 19.9                                                                               | 5.4                                                                                 | 3.4                                                                                 | 0.7                                                                                 | 8.1                                                                                 | 1.3                                                                                 | 1.3                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 10.7                                                                              | 0.0                                                                               | 0.2                                                                               | 4.0                                                                               | 3.3                                                                               | 19.0                                                                               | 2.3                                                                                 | 17.1                                                                                | 3.3                                                                                 | 12.9                                                                                | 0.4                                                                                 | 0.4                                                                                 |
| LnGrp Delay(d),s/veh         | 63.6                                                                              | 0.0                                                                               | 42.9                                                                              | 40.7                                                                              | 33.9                                                                              | 64.4                                                                               | 69.3                                                                                | 39.4                                                                                | 28.6                                                                                | 46.4                                                                                | 1.3                                                                                 | 1.3                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 | C                                                                                 | E                                                                                  | E                                                                                   | D                                                                                   | C                                                                                   | D                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 274                                                                               |                                                                                   |                                                                                   | 710                                                                               |                                                                                    |                                                                                     | 1210                                                                                |                                                                                     |                                                                                     | 2086                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 63.0                                                                              |                                                                                   |                                                                                   | 54.7                                                                              |                                                                                    |                                                                                     | 39.7                                                                                |                                                                                     |                                                                                     | 16.1                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                    |                                                                                     | D                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                  | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                  |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 9.9                                                                               | 78.4                                                                              | 15.0                                                                              | 31.7                                                                              | 32.4                                                                              | 55.9                                                                               |                                                                                     | 46.7                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 4.0                                                                               | 5.0                                                                                |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 18.0                                                                              | 56.0                                                                              | 15.0                                                                              | 27.0                                                                              | 30.0                                                                              | 44.0                                                                               |                                                                                     | 47.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 6.5                                                                               | 2.0                                                                               | 9.8                                                                               | 25.5                                                                              | 27.9                                                                              | 35.7                                                                               |                                                                                     | 40.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.1                                                                               | 22.6                                                                              | 0.2                                                                               | 0.2                                                                               | 0.6                                                                               | 5.6                                                                                |                                                                                     | 1.7                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 32.2                                                                              |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



---

## **APPENDIX C**

### **LEVEL OF SERVICE CALCULATIONS**

- Base Year 2022 WE Peak
-

# HCM 2010 Signalized Intersection Summary

## 1: Napilihau Street

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 40                                                                                | 45                                                                                | 330                                                                               | 45                                                                                | 50                                                                                | 20                                                                                | 270                                                                                 | 310                                                                                 | 40                                                                                  | 20                                                                                  | 280                                                                                 | 90                                                                                  |
| Future Volume (veh/h)        | 40                                                                                | 45                                                                                | 330                                                                               | 45                                                                                | 50                                                                                | 20                                                                                | 270                                                                                 | 310                                                                                 | 40                                                                                  | 20                                                                                  | 280                                                                                 | 90                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.99                                                                              | 0.99                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 43                                                                                | 49                                                                                | 36                                                                                | 49                                                                                | 54                                                                                | 10                                                                                | 293                                                                                 | 337                                                                                 | 22                                                                                  | 22                                                                                  | 304                                                                                 | 28                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 193                                                                               | 136                                                                               | 204                                                                               | 268                                                                               | 199                                                                               | 37                                                                                | 380                                                                                 | 905                                                                                 | 767                                                                                 | 29                                                                                  | 536                                                                                 | 455                                                                                 |
| Arrive On Green              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.21                                                                                | 0.49                                                                                | 0.49                                                                                | 0.02                                                                                | 0.29                                                                                | 0.29                                                                                |
| Sat Flow, veh/h              | 552                                                                               | 1045                                                                              | 1566                                                                              | 1297                                                                              | 1527                                                                              | 283                                                                               | 1774                                                                                | 1863                                                                                | 1580                                                                                | 1774                                                                                | 1863                                                                                | 1581                                                                                |
| Grp Volume(v), veh/h         | 92                                                                                | 0                                                                                 | 36                                                                                | 49                                                                                | 0                                                                                 | 64                                                                                | 293                                                                                 | 337                                                                                 | 22                                                                                  | 22                                                                                  | 304                                                                                 | 28                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1597                                                                              | 0                                                                                 | 1566                                                                              | 1297                                                                              | 0                                                                                 | 1809                                                                              | 1774                                                                                | 1863                                                                                | 1580                                                                                | 1774                                                                                | 1863                                                                                | 1581                                                                                |
| Q Serve(g_s), s              | 0.8                                                                               | 0.0                                                                               | 0.9                                                                               | 1.6                                                                               | 0.0                                                                               | 1.4                                                                               | 6.8                                                                                 | 4.9                                                                                 | 0.3                                                                                 | 0.5                                                                                 | 6.0                                                                                 | 0.6                                                                                 |
| Cycle Q Clear(g_c), s        | 2.2                                                                               | 0.0                                                                               | 0.9                                                                               | 3.8                                                                               | 0.0                                                                               | 1.4                                                                               | 6.8                                                                                 | 4.9                                                                                 | 0.3                                                                                 | 0.5                                                                                 | 6.0                                                                                 | 0.6                                                                                 |
| Prop In Lane                 | 0.47                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.16                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 330                                                                               | 0                                                                                 | 204                                                                               | 268                                                                               | 0                                                                                 | 236                                                                               | 380                                                                                 | 905                                                                                 | 767                                                                                 | 29                                                                                  | 536                                                                                 | 455                                                                                 |
| V/C Ratio(X)                 | 0.28                                                                              | 0.00                                                                              | 0.18                                                                              | 0.18                                                                              | 0.00                                                                              | 0.27                                                                              | 0.77                                                                                | 0.37                                                                                | 0.03                                                                                | 0.77                                                                                | 0.57                                                                                | 0.06                                                                                |
| Avail Cap(c_a), veh/h        | 988                                                                               | 0                                                                                 | 864                                                                               | 814                                                                               | 0                                                                                 | 998                                                                               | 1224                                                                                | 3383                                                                                | 2870                                                                                | 612                                                                                 | 2741                                                                                | 2326                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 17.4                                                                              | 0.0                                                                               | 16.8                                                                              | 19.2                                                                              | 0.0                                                                               | 17.0                                                                              | 16.1                                                                                | 7.0                                                                                 | 5.8                                                                                 | 21.3                                                                                | 13.2                                                                                | 11.2                                                                                |
| Incr Delay (d2), s/veh       | 0.5                                                                               | 0.0                                                                               | 0.4                                                                               | 0.3                                                                               | 0.0                                                                               | 0.6                                                                               | 3.4                                                                                 | 0.5                                                                                 | 0.0                                                                                 | 34.3                                                                                | 2.0                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.1                                                                               | 0.0                                                                               | 0.4                                                                               | 0.6                                                                               | 0.0                                                                               | 0.7                                                                               | 3.6                                                                                 | 2.7                                                                                 | 0.1                                                                                 | 0.5                                                                                 | 3.3                                                                                 | 0.3                                                                                 |
| LnGrp Delay(d),s/veh         | 17.8                                                                              | 0.0                                                                               | 17.2                                                                              | 19.5                                                                              | 0.0                                                                               | 17.7                                                                              | 19.5                                                                                | 7.6                                                                                 | 5.9                                                                                 | 55.6                                                                                | 15.2                                                                                | 11.4                                                                                |
| LnGrp LOS                    | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 128                                                                               |                                                                                   |                                                                                   | 113                                                                               |                                                                                   |                                                                                     | 652                                                                                 |                                                                                     |                                                                                     | 354                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 17.7                                                                              |                                                                                   |                                                                                   | 18.5                                                                              |                                                                                   |                                                                                     | 12.9                                                                                |                                                                                     |                                                                                     | 17.4                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.7                                                                               | 27.1                                                                              |                                                                                   | 10.7                                                                              | 14.3                                                                              | 18.5                                                                              |                                                                                     | 10.7                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 79.0                                                                              |                                                                                   | 24.0                                                                              | 30.0                                                                              | 64.0                                                                              |                                                                                     | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.5                                                                               | 6.9                                                                               |                                                                                   | 4.2                                                                               | 8.8                                                                               | 8.0                                                                               |                                                                                     | 5.8                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 4.8                                                                               |                                                                                   | 0.5                                                                               | 0.8                                                                               | 4.2                                                                               |                                                                                     | 0.4                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 15.1                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 2: Hoohui Road

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 55                                                                                | 20                                                                                | 195                                                                               | 40                                                                                | 15                                                                                | 5                                                                                 | 135                                                                                | 445                                                                                 | 25                                                                                  | 15                                                                                  | 485                                                                                 | 60                                                                                  |
| Future Volume (veh/h)        | 55                                                                                | 20                                                                                | 195                                                                               | 40                                                                                | 15                                                                                | 5                                                                                 | 135                                                                                | 445                                                                                 | 25                                                                                  | 15                                                                                  | 485                                                                                 | 60                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                  | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                              |                                                                                   | 0.98                                                                              | 0.99                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 60                                                                                | 22                                                                                | 23                                                                                | 43                                                                                | 16                                                                                | 1                                                                                 | 147                                                                                | 484                                                                                 | 0                                                                                   | 16                                                                                  | 527                                                                                 | 25                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 291                                                                               | 84                                                                                | 232                                                                               | 310                                                                               | 259                                                                               | 16                                                                                | 443                                                                                | 854                                                                                 | 726                                                                                 | 436                                                                                 | 721                                                                                 | 611                                                                                 |
| Arrive On Green              | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.08                                                                               | 0.46                                                                                | 0.00                                                                                | 0.01                                                                                | 0.39                                                                                | 0.39                                                                                |
| Sat Flow, veh/h              | 954                                                                               | 564                                                                               | 1557                                                                              | 1337                                                                              | 1733                                                                              | 108                                                                               | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1577                                                                                |
| Grp Volume(v), veh/h         | 82                                                                                | 0                                                                                 | 23                                                                                | 43                                                                                | 0                                                                                 | 17                                                                                | 147                                                                                | 484                                                                                 | 0                                                                                   | 16                                                                                  | 527                                                                                 | 25                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1518                                                                              | 0                                                                                 | 1557                                                                              | 1337                                                                              | 0                                                                                 | 1841                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1577                                                                                |
| Q Serve(g_s), s              | 1.2                                                                               | 0.0                                                                               | 0.5                                                                               | 1.3                                                                               | 0.0                                                                               | 0.3                                                                               | 2.0                                                                                | 8.0                                                                                 | 0.0                                                                                 | 0.2                                                                                 | 10.2                                                                                | 0.4                                                                                 |
| Cycle Q Clear(g_c), s        | 1.9                                                                               | 0.0                                                                               | 0.5                                                                               | 3.2                                                                               | 0.0                                                                               | 0.3                                                                               | 2.0                                                                                | 8.0                                                                                 | 0.0                                                                                 | 0.2                                                                                 | 10.2                                                                                | 0.4                                                                                 |
| Prop In Lane                 | 0.73                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 375                                                                               | 0                                                                                 | 232                                                                               | 310                                                                               | 0                                                                                 | 275                                                                               | 443                                                                                | 854                                                                                 | 726                                                                                 | 436                                                                                 | 721                                                                                 | 611                                                                                 |
| V/C Ratio(X)                 | 0.22                                                                              | 0.00                                                                              | 0.10                                                                              | 0.14                                                                              | 0.00                                                                              | 0.06                                                                              | 0.33                                                                               | 0.57                                                                                | 0.00                                                                                | 0.04                                                                                | 0.73                                                                                | 0.04                                                                                |
| Avail Cap(c_a), veh/h        | 1030                                                                              | 0                                                                                 | 925                                                                               | 905                                                                               | 0                                                                                 | 1094                                                                              | 927                                                                                | 2258                                                                                | 1920                                                                                | 1047                                                                                | 2258                                                                                | 1912                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 0.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 16.0                                                                              | 0.0                                                                               | 15.5                                                                              | 17.5                                                                              | 0.0                                                                               | 15.4                                                                              | 7.9                                                                                | 8.3                                                                                 | 0.0                                                                                 | 8.0                                                                                 | 11.0                                                                                | 8.0                                                                                 |
| Incr Delay (d2), s/veh       | 0.3                                                                               | 0.0                                                                               | 0.2                                                                               | 0.2                                                                               | 0.0                                                                               | 0.1                                                                               | 0.4                                                                                | 0.6                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 1.4                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.9                                                                               | 0.0                                                                               | 0.2                                                                               | 0.5                                                                               | 0.0                                                                               | 0.2                                                                               | 1.0                                                                                | 4.2                                                                                 | 0.0                                                                                 | 0.1                                                                                 | 5.4                                                                                 | 0.2                                                                                 |
| LnGrp Delay(d),s/veh         | 16.3                                                                              | 0.0                                                                               | 15.6                                                                              | 17.7                                                                              | 0.0                                                                               | 15.5                                                                              | 8.4                                                                                | 8.9                                                                                 | 0.0                                                                                 | 8.0                                                                                 | 12.5                                                                                | 8.1                                                                                 |
| LnGrp LOS                    | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                 |                                                                                   | B                                                                                 | A                                                                                  | A                                                                                   |                                                                                     | A                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 105                                                                               |                                                                                   |                                                                                   | 60                                                                                |                                                                                   |                                                                                    | 631                                                                                 |                                                                                     |                                                                                     | 568                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 16.1                                                                              |                                                                                   |                                                                                   | 17.0                                                                              |                                                                                   |                                                                                    | 8.8                                                                                 |                                                                                     |                                                                                     | 12.1                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                    | A                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.5                                                                               | 25.3                                                                              |                                                                                   | 11.3                                                                              | 8.5                                                                               | 22.3                                                                              |                                                                                    | 11.3                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 51.0                                                                              |                                                                                   | 25.0                                                                              | 15.0                                                                              | 51.0                                                                              |                                                                                    | 25.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.2                                                                               | 10.0                                                                              |                                                                                   | 3.9                                                                               | 4.0                                                                               | 12.2                                                                              |                                                                                    | 5.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 3.3                                                                               |                                                                                   | 0.4                                                                               | 0.3                                                                               | 3.8                                                                               |                                                                                    | 0.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 11.1                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 3: Honoapiilani Highway & Akahele Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 40                                                                                | 5                                                                                 | 85                                                                                | 10                                                                                | 5                                                                                 | 10                                                                                | 80                                                                                 | 550                                                                                 | 15                                                                                  | 5                                                                                   | 675                                                                                 | 50                                                                                  |
| Future Volume (veh/h)        | 40                                                                                | 5                                                                                 | 85                                                                                | 10                                                                                | 5                                                                                 | 10                                                                                | 80                                                                                 | 550                                                                                 | 15                                                                                  | 5                                                                                   | 675                                                                                 | 50                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                  | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 43                                                                                | 5                                                                                 | 7                                                                                 | 11                                                                                | 5                                                                                 | 1                                                                                 | 87                                                                                 | 598                                                                                 | 9                                                                                   | 5                                                                                   | 734                                                                                 | 26                                                                                  |
| Adj No. of Lanes             | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 61                                                                                | 78                                                                                | 110                                                                               | 20                                                                                | 166                                                                               | 141                                                                               | 115                                                                                | 1000                                                                                | 850                                                                                 | 7                                                                                   | 887                                                                                 | 753                                                                                 |
| Arrive On Green              | 0.03                                                                              | 0.11                                                                              | 0.11                                                                              | 0.01                                                                              | 0.09                                                                              | 0.09                                                                              | 0.06                                                                               | 0.54                                                                                | 0.54                                                                                | 0.00                                                                                | 0.48                                                                                | 0.48                                                                                |
| Sat Flow, veh/h              | 1774                                                                              | 700                                                                               | 980                                                                               | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1582                                                                                |
| Grp Volume(v), veh/h         | 43                                                                                | 0                                                                                 | 12                                                                                | 11                                                                                | 5                                                                                 | 1                                                                                 | 87                                                                                 | 598                                                                                 | 9                                                                                   | 5                                                                                   | 734                                                                                 | 26                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1774                                                                              | 0                                                                                 | 1679                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1582                                                                                |
| Q Serve(g_s), s              | 1.4                                                                               | 0.0                                                                               | 0.4                                                                               | 0.4                                                                               | 0.1                                                                               | 0.0                                                                               | 2.9                                                                                | 13.0                                                                                | 0.2                                                                                 | 0.2                                                                                 | 20.3                                                                                | 0.5                                                                                 |
| Cycle Q Clear(g_c), s        | 1.4                                                                               | 0.0                                                                               | 0.4                                                                               | 0.4                                                                               | 0.1                                                                               | 0.0                                                                               | 2.9                                                                                | 13.0                                                                                | 0.2                                                                                 | 0.2                                                                                 | 20.3                                                                                | 0.5                                                                                 |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 0.58                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 61                                                                                | 0                                                                                 | 188                                                                               | 20                                                                                | 166                                                                               | 141                                                                               | 115                                                                                | 1000                                                                                | 850                                                                                 | 7                                                                                   | 887                                                                                 | 753                                                                                 |
| V/C Ratio(X)                 | 0.71                                                                              | 0.00                                                                              | 0.06                                                                              | 0.55                                                                              | 0.03                                                                              | 0.01                                                                              | 0.76                                                                               | 0.60                                                                                | 0.01                                                                                | 0.70                                                                                | 0.83                                                                                | 0.03                                                                                |
| Avail Cap(c_a), veh/h        | 596                                                                               | 0                                                                                 | 592                                                                               | 596                                                                               | 657                                                                               | 558                                                                               | 745                                                                                | 2033                                                                                | 1728                                                                                | 745                                                                                 | 2033                                                                                | 1727                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 28.5                                                                              | 0.0                                                                               | 23.6                                                                              | 29.3                                                                              | 24.8                                                                              | 24.7                                                                              | 27.4                                                                               | 9.4                                                                                 | 6.4                                                                                 | 29.6                                                                                | 13.5                                                                                | 8.3                                                                                 |
| Incr Delay (d2), s/veh       | 14.1                                                                              | 0.0                                                                               | 0.1                                                                               | 22.0                                                                              | 0.1                                                                               | 0.0                                                                               | 9.7                                                                                | 0.6                                                                                 | 0.0                                                                                 | 81.2                                                                                | 2.0                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.9                                                                               | 0.0                                                                               | 0.2                                                                               | 0.3                                                                               | 0.1                                                                               | 0.0                                                                               | 1.7                                                                                | 6.8                                                                                 | 0.1                                                                                 | 0.2                                                                                 | 10.7                                                                                | 0.2                                                                                 |
| LnGrp Delay(d),s/veh         | 42.6                                                                              | 0.0                                                                               | 23.8                                                                              | 51.3                                                                              | 24.8                                                                              | 24.7                                                                              | 37.1                                                                               | 10.0                                                                                | 6.4                                                                                 | 110.8                                                                               | 15.5                                                                                | 8.3                                                                                 |
| LnGrp LOS                    | D                                                                                 |                                                                                   | C                                                                                 | D                                                                                 | C                                                                                 | C                                                                                 | D                                                                                  | A                                                                                   | A                                                                                   | F                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 55                                                                                |                                                                                   |                                                                                   | 17                                                                                |                                                                                   |                                                                                    | 694                                                                                 |                                                                                     |                                                                                     | 765                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 38.5                                                                              |                                                                                   |                                                                                   | 42.0                                                                              |                                                                                   |                                                                                    | 13.3                                                                                |                                                                                     |                                                                                     | 15.9                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.2                                                                               | 37.0                                                                              | 5.7                                                                               | 11.7                                                                              | 8.9                                                                               | 33.4                                                                              | 7.0                                                                                | 10.3                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              | 25.0                                                                              | 65.0                                                                              | 20.0                                                                               | 21.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.2                                                                               | 15.0                                                                              | 2.4                                                                               | 2.4                                                                               | 4.9                                                                               | 22.3                                                                              | 3.4                                                                                | 2.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 4.5                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                               | 6.1                                                                               | 0.1                                                                                | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 15.8                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 4: Honoapiilani Highway & Lower Honoapiilani Road

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 50                                                                                | 10                                                                                | 595                                                                               | 10                                                                                | 0                                                                                 | 5                                                                                 | 410                                                                                 | 595                                                                                 | 5                                                                                   | 0                                                                                   | 730                                                                                 | 50                                                                                  |
| Future Volume (veh/h)        | 50                                                                                | 10                                                                                | 595                                                                               | 10                                                                                | 0                                                                                 | 5                                                                                 | 410                                                                                 | 595                                                                                 | 5                                                                                   | 0                                                                                   | 730                                                                                 | 50                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 54                                                                                | 11                                                                                | 0                                                                                 | 11                                                                                | 0                                                                                 | 1                                                                                 | 446                                                                                 | 647                                                                                 | 5                                                                                   | 0                                                                                   | 793                                                                                 | 17                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 190                                                                               | 15                                                                                | 97                                                                                | 206                                                                               | 4                                                                                 | 8                                                                                 | 516                                                                                 | 2695                                                                                | 21                                                                                  | 3                                                                                   | 1376                                                                                | 613                                                                                 |
| Arrive On Green              | 0.08                                                                              | 0.06                                                                              | 0.00                                                                              | 0.08                                                                              | 0.00                                                                              | 0.06                                                                              | 0.29                                                                                | 0.75                                                                                | 0.75                                                                                | 0.00                                                                                | 0.39                                                                                | 0.39                                                                                |
| Sat Flow, veh/h              | 1239                                                                              | 252                                                                               | 1583                                                                              | 1407                                                                              | 67                                                                                | 134                                                                               | 1774                                                                                | 3600                                                                                | 28                                                                                  | 1774                                                                                | 3539                                                                                | 1577                                                                                |
| Grp Volume(v), veh/h         | 65                                                                                | 0                                                                                 | 0                                                                                 | 12                                                                                | 0                                                                                 | 0                                                                                 | 446                                                                                 | 318                                                                                 | 334                                                                                 | 0                                                                                   | 793                                                                                 | 17                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1491                                                                              | 0                                                                                 | 1583                                                                              | 1608                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1858                                                                                | 1774                                                                                | 1770                                                                                | 1577                                                                                |
| Q Serve(g_s), s              | 2.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 13.8                                                                                | 3.2                                                                                 | 3.2                                                                                 | 0.0                                                                                 | 10.2                                                                                | 0.4                                                                                 |
| Cycle Q Clear(g_c), s        | 2.4                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 13.8                                                                                | 3.2                                                                                 | 3.2                                                                                 | 0.0                                                                                 | 10.2                                                                                | 0.4                                                                                 |
| Prop In Lane                 | 0.83                                                                              |                                                                                   | 1.00                                                                              | 0.92                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                                |                                                                                     | 0.01                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 231                                                                               | 0                                                                                 | 97                                                                                | 246                                                                               | 0                                                                                 | 0                                                                                 | 516                                                                                 | 1325                                                                                | 1391                                                                                | 3                                                                                   | 1376                                                                                | 613                                                                                 |
| V/C Ratio(X)                 | 0.28                                                                              | 0.00                                                                              | 0.00                                                                              | 0.05                                                                              | 0.00                                                                              | 0.00                                                                              | 0.87                                                                                | 0.24                                                                                | 0.24                                                                                | 0.00                                                                                | 0.58                                                                                | 0.03                                                                                |
| Avail Cap(c_a), veh/h        | 648                                                                               | 0                                                                                 | 547                                                                               | 769                                                                               | 0                                                                                 | 0                                                                                 | 2176                                                                                | 2110                                                                                | 2215                                                                                | 2176                                                                                | 4219                                                                                | 1880                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 0.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 26.2                                                                              | 0.0                                                                               | 0.0                                                                               | 25.2                                                                              | 0.0                                                                               | 0.0                                                                               | 19.5                                                                                | 2.2                                                                                 | 2.2                                                                                 | 0.0                                                                                 | 13.9                                                                                | 10.9                                                                                |
| Incr Delay (d2), s/veh       | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 1.7                                                                                 | 0.2                                                                                 | 0.2                                                                                 | 0.0                                                                                 | 0.8                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 6.9                                                                                 | 1.6                                                                                 | 1.7                                                                                 | 0.0                                                                                 | 5.1                                                                                 | 0.2                                                                                 |
| LnGrp Delay(d),s/veh         | 26.8                                                                              | 0.0                                                                               | 0.0                                                                               | 25.3                                                                              | 0.0                                                                               | 0.0                                                                               | 21.2                                                                                | 2.4                                                                                 | 2.4                                                                                 | 0.0                                                                                 | 14.7                                                                                | 11.0                                                                                |
| LnGrp LOS                    | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                   | A                                                                                   | A                                                                                   |                                                                                     | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 65                                                                                |                                                                                   |                                                                                   | 12                                                                                |                                                                                   |                                                                                     | 1098                                                                                |                                                                                     |                                                                                     | 810                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 26.8                                                                              |                                                                                   |                                                                                   | 25.3                                                                              |                                                                                   |                                                                                     | 10.1                                                                                |                                                                                     |                                                                                     | 14.7                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 20.8                                                                              | 28.5                                                                              |                                                                                   | 8.6                                                                               | 0.0                                                                               | 49.3                                                                              |                                                                                     | 8.6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 71.0                                                                              | 69.0                                                                              |                                                                                   | 25.0                                                                              | 71.0                                                                              | 69.0                                                                              |                                                                                     | 20.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 15.8                                                                              | 12.2                                                                              |                                                                                   | 2.4                                                                               | 0.0                                                                               | 5.2                                                                               |                                                                                     | 4.4                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 1.0                                                                               | 10.3                                                                              |                                                                                   | 0.0                                                                               | 0.0                                                                               | 7.0                                                                               |                                                                                     | 0.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 12.6                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 5: Honoapiilani Highway & Halawai Drive

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 55                                                                                | 5                                                                                 | 145                                                                               | 15                                                                                | 5                                                                                 | 15                                                                                | 105                                                                                 | 950                                                                                 | 20                                                                                  | 10                                                                                  | 1295                                                                                | 65                                                                                  |
| Future Volume (veh/h)        | 55                                                                                | 5                                                                                 | 145                                                                               | 15                                                                                | 5                                                                                 | 15                                                                                | 105                                                                                 | 950                                                                                 | 20                                                                                  | 10                                                                                  | 1295                                                                                | 65                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                              |                                                                                   | 0.98                                                                              | 0.98                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 60                                                                                | 5                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                 | 1                                                                                 | 114                                                                                 | 1033                                                                                | 21                                                                                  | 11                                                                                  | 1408                                                                                | 38                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 224                                                                               | 14                                                                                | 142                                                                               | 154                                                                               | 37                                                                                | 5                                                                                 | 146                                                                                 | 2493                                                                                | 51                                                                                  | 15                                                                                  | 2225                                                                                | 993                                                                                 |
| Arrive On Green              | 0.11                                                                              | 0.09                                                                              | 0.09                                                                              | 0.11                                                                              | 0.09                                                                              | 0.09                                                                              | 0.08                                                                                | 0.70                                                                                | 0.70                                                                                | 0.01                                                                                | 0.63                                                                                | 0.63                                                                                |
| Sat Flow, veh/h              | 1370                                                                              | 155                                                                               | 1547                                                                              | 724                                                                               | 400                                                                               | 54                                                                                | 1774                                                                                | 3548                                                                                | 72                                                                                  | 1774                                                                                | 3539                                                                                | 1580                                                                                |
| Grp Volume(v), veh/h         | 65                                                                                | 0                                                                                 | 6                                                                                 | 22                                                                                | 0                                                                                 | 0                                                                                 | 114                                                                                 | 515                                                                                 | 539                                                                                 | 11                                                                                  | 1408                                                                                | 38                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1525                                                                              | 0                                                                                 | 1547                                                                              | 1177                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1850                                                                                | 1774                                                                                | 1770                                                                                | 1580                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.3                                                                               | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 4.5                                                                                 | 8.7                                                                                 | 8.7                                                                                 | 0.4                                                                                 | 17.4                                                                                | 0.7                                                                                 |
| Cycle Q Clear(g_c), s        | 2.4                                                                               | 0.0                                                                               | 0.3                                                                               | 2.5                                                                               | 0.0                                                                               | 0.0                                                                               | 4.5                                                                                 | 8.7                                                                                 | 8.7                                                                                 | 0.4                                                                                 | 17.4                                                                                | 0.7                                                                                 |
| Prop In Lane                 | 0.92                                                                              |                                                                                   | 1.00                                                                              | 0.73                                                                              |                                                                                   | 0.05                                                                              | 1.00                                                                                |                                                                                     | 0.04                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 259                                                                               | 0                                                                                 | 142                                                                               | 212                                                                               | 0                                                                                 | 0                                                                                 | 146                                                                                 | 1244                                                                                | 1300                                                                                | 15                                                                                  | 2225                                                                                | 993                                                                                 |
| V/C Ratio(X)                 | 0.25                                                                              | 0.00                                                                              | 0.04                                                                              | 0.10                                                                              | 0.00                                                                              | 0.00                                                                              | 0.78                                                                                | 0.41                                                                                | 0.41                                                                                | 0.75                                                                                | 0.63                                                                                | 0.04                                                                                |
| Avail Cap(c_a), veh/h        | 586                                                                               | 0                                                                                 | 501                                                                               | 553                                                                               | 0                                                                                 | 0                                                                                 | 524                                                                                 | 2141                                                                                | 2238                                                                                | 275                                                                                 | 3784                                                                                | 1689                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 30.0                                                                              | 0.0                                                                               | 29.4                                                                              | 29.4                                                                              | 0.0                                                                               | 0.0                                                                               | 32.0                                                                                | 4.4                                                                                 | 4.4                                                                                 | 35.2                                                                                | 8.1                                                                                 | 5.0                                                                                 |
| Incr Delay (d2), s/veh       | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 3.4                                                                                 | 0.5                                                                                 | 0.5                                                                                 | 24.5                                                                                | 0.6                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.2                                                                               | 0.0                                                                               | 0.1                                                                               | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 2.3                                                                                 | 4.3                                                                                 | 4.5                                                                                 | 0.3                                                                                 | 8.6                                                                                 | 0.3                                                                                 |
| LnGrp Delay(d),s/veh         | 30.2                                                                              | 0.0                                                                               | 29.5                                                                              | 29.5                                                                              | 0.0                                                                               | 0.0                                                                               | 35.3                                                                                | 4.9                                                                                 | 4.9                                                                                 | 59.7                                                                                | 8.8                                                                                 | 5.1                                                                                 |
| LnGrp LOS                    | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                 |                                                                                   |                                                                                   | D                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 71                                                                                |                                                                                   |                                                                                   | 22                                                                                |                                                                                   |                                                                                     | 1168                                                                                |                                                                                     |                                                                                     | 1457                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 30.1                                                                              |                                                                                   |                                                                                   | 29.5                                                                              |                                                                                   |                                                                                     | 7.9                                                                                 |                                                                                     |                                                                                     | 9.1                                                                                 |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 9.9                                                                               | 49.7                                                                              |                                                                                   | 11.5                                                                              | 4.6                                                                               | 55.0                                                                              |                                                                                     | 11.5                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 21.0                                                                              | 76.0                                                                              |                                                                                   | 23.0                                                                              | 11.0                                                                              | 86.0                                                                              |                                                                                     | 23.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 6.5                                                                               | 19.4                                                                              |                                                                                   | 4.5                                                                               | 2.4                                                                               | 10.7                                                                              |                                                                                     | 4.4                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.1                                                                               | 25.2                                                                              |                                                                                   | 0.0                                                                               | 0.0                                                                               | 14.4                                                                              |                                                                                     | 0.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 9.3                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 6: Honoapiilani Highway & Kai Ala Drive/Puukolii Road

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 60                                                                                | 5                                                                                 | 180                                                                               | 45                                                                                | 5                                                                                 | 35                                                                                | 110                                                                                | 1025                                                                                | 50                                                                                  | 30                                                                                  | 1375                                                                                | 75                                                                                  |
| Future Volume (veh/h)        | 60                                                                                | 5                                                                                 | 180                                                                               | 45                                                                                | 5                                                                                 | 35                                                                                | 110                                                                                | 1025                                                                                | 50                                                                                  | 30                                                                                  | 1375                                                                                | 75                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 65                                                                                | 5                                                                                 | 12                                                                                | 49                                                                                | 5                                                                                 | 2                                                                                 | 120                                                                                | 1114                                                                                | 34                                                                                  | 33                                                                                  | 1495                                                                                | 45                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 2                                                                                   | 1                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 275                                                                               | 18                                                                                | 232                                                                               | 230                                                                               | 186                                                                               | 75                                                                                | 154                                                                                | 2255                                                                                | 1009                                                                                | 57                                                                                  | 2062                                                                                | 922                                                                                 |
| Arrive On Green              | 0.16                                                                              | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.09                                                                               | 0.64                                                                                | 0.64                                                                                | 0.03                                                                                | 0.58                                                                                | 0.58                                                                                |
| Sat Flow, veh/h              | 1293                                                                              | 121                                                                               | 1577                                                                              | 1386                                                                              | 1265                                                                              | 506                                                                               | 1774                                                                               | 3539                                                                                | 1583                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 70                                                                                | 0                                                                                 | 12                                                                                | 49                                                                                | 0                                                                                 | 7                                                                                 | 120                                                                                | 1114                                                                                | 34                                                                                  | 33                                                                                  | 1495                                                                                | 45                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1415                                                                              | 0                                                                                 | 1577                                                                              | 1386                                                                              | 0                                                                                 | 1771                                                                              | 1774                                                                               | 1770                                                                                | 1583                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 3.4                                                                               | 0.0                                                                               | 0.5                                                                               | 2.7                                                                               | 0.0                                                                               | 0.3                                                                               | 5.4                                                                                | 13.6                                                                                | 0.7                                                                                 | 1.5                                                                                 | 25.0                                                                                | 1.0                                                                                 |
| Cycle Q Clear(g_c), s        | 3.6                                                                               | 0.0                                                                               | 0.5                                                                               | 6.3                                                                               | 0.0                                                                               | 0.3                                                                               | 5.4                                                                                | 13.6                                                                                | 0.7                                                                                 | 1.5                                                                                 | 25.0                                                                                | 1.0                                                                                 |
| Prop In Lane                 | 0.93                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.29                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 311                                                                               | 0                                                                                 | 232                                                                               | 230                                                                               | 0                                                                                 | 261                                                                               | 154                                                                                | 2255                                                                                | 1009                                                                                | 57                                                                                  | 2062                                                                                | 922                                                                                 |
| V/C Ratio(X)                 | 0.23                                                                              | 0.00                                                                              | 0.05                                                                              | 0.21                                                                              | 0.00                                                                              | 0.03                                                                              | 0.78                                                                               | 0.49                                                                                | 0.03                                                                                | 0.58                                                                                | 0.73                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h        | 519                                                                               | 0                                                                                 | 463                                                                               | 433                                                                               | 0                                                                                 | 520                                                                               | 456                                                                                | 2986                                                                                | 1336                                                                                | 260                                                                                 | 2596                                                                                | 1162                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 30.9                                                                              | 0.0                                                                               | 30.0                                                                              | 34.1                                                                              | 0.0                                                                               | 29.9                                                                              | 36.6                                                                               | 7.9                                                                                 | 5.5                                                                                 | 39.0                                                                                | 12.3                                                                                | 7.3                                                                                 |
| Incr Delay (d2), s/veh       | 0.4                                                                               | 0.0                                                                               | 0.1                                                                               | 0.5                                                                               | 0.0                                                                               | 0.0                                                                               | 3.2                                                                                | 0.4                                                                                 | 0.0                                                                                 | 3.4                                                                                 | 1.2                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.4                                                                               | 0.0                                                                               | 0.2                                                                               | 1.1                                                                               | 0.0                                                                               | 0.1                                                                               | 2.8                                                                                | 6.6                                                                                 | 0.3                                                                                 | 0.8                                                                                 | 12.4                                                                                | 0.4                                                                                 |
| LnGrp Delay(d),s/veh         | 31.3                                                                              | 0.0                                                                               | 30.1                                                                              | 34.6                                                                              | 0.0                                                                               | 29.9                                                                              | 39.8                                                                               | 8.2                                                                                 | 5.5                                                                                 | 42.4                                                                                | 13.6                                                                                | 7.4                                                                                 |
| LnGrp LOS                    | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                 |                                                                                   | C                                                                                 | D                                                                                  | A                                                                                   | A                                                                                   | D                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 82                                                                                |                                                                                   |                                                                                   | 56                                                                                |                                                                                   |                                                                                    | 1268                                                                                |                                                                                     |                                                                                     | 1573                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 31.1                                                                              |                                                                                   |                                                                                   | 34.0                                                                              |                                                                                   |                                                                                    | 11.1                                                                                |                                                                                     |                                                                                     | 14.0                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 11.1                                                                              | 53.6                                                                              |                                                                                   | 17.0                                                                              | 6.6                                                                               | 58.1                                                                              |                                                                                    | 17.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 21.0                                                                              | 60.0                                                                              |                                                                                   | 24.0                                                                              | 12.0                                                                              | 69.0                                                                              |                                                                                    | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 7.4                                                                               | 27.0                                                                              |                                                                                   | 8.3                                                                               | 3.5                                                                               | 15.6                                                                              |                                                                                    | 5.6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.2                                                                               | 20.7                                                                              |                                                                                   | 0.1                                                                               | 0.0                                                                               | 17.1                                                                              |                                                                                    | 0.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   |                                                                                   | 13.6                                                                              |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 7: Honoapiilani Highway & Kaanapali Parkway/Halelo Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 235                                                                               | 5                                                                                 | 445                                                                               | 15                                                                                | 5                                                                                 | 20                                                                                | 290                                                                                | 1150                                                                                | 15                                                                                  | 55                                                                                  | 1380                                                                                | 155                                                                                 |
| Future Volume (veh/h)        | 235                                                                               | 5                                                                                 | 445                                                                               | 15                                                                                | 5                                                                                 | 20                                                                                | 290                                                                                | 1150                                                                                | 15                                                                                  | 55                                                                                  | 1380                                                                                | 155                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 255                                                                               | 5                                                                                 | 283                                                                               | 16                                                                                | 5                                                                                 | 7                                                                                 | 315                                                                                | 1250                                                                                | 16                                                                                  | 60                                                                                  | 1500                                                                                | 125                                                                                 |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 2                                                                                  | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 321                                                                               | 6                                                                                 | 836                                                                               | 45                                                                                | 14                                                                                | 20                                                                                | 423                                                                                | 2128                                                                                | 27                                                                                  | 109                                                                                 | 1888                                                                                | 844                                                                                 |
| Arrive On Green              | 0.18                                                                              | 0.18                                                                              | 0.18                                                                              | 0.05                                                                              | 0.05                                                                              | 0.02                                                                              | 0.12                                                                               | 0.59                                                                                | 0.58                                                                                | 0.06                                                                                | 0.53                                                                                | 0.53                                                                                |
| Sat Flow, veh/h              | 1742                                                                              | 34                                                                                | 2787                                                                              | 992                                                                               | 310                                                                               | 434                                                                               | 3442                                                                               | 3578                                                                                | 46                                                                                  | 1774                                                                                | 3539                                                                                | 1582                                                                                |
| Grp Volume(v), veh/h         | 260                                                                               | 0                                                                                 | 283                                                                               | 28                                                                                | 0                                                                                 | 0                                                                                 | 315                                                                                | 618                                                                                 | 648                                                                                 | 60                                                                                  | 1500                                                                                | 125                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1776                                                                              | 0                                                                                 | 1393                                                                              | 1737                                                                              | 0                                                                                 | 0                                                                                 | 1721                                                                               | 1770                                                                                | 1855                                                                                | 1774                                                                                | 1770                                                                                | 1582                                                                                |
| Q Serve(g_s), s              | 19.6                                                                              | 0.0                                                                               | 11.1                                                                              | 2.2                                                                               | 0.0                                                                               | 0.0                                                                               | 12.4                                                                               | 30.5                                                                                | 30.5                                                                                | 4.6                                                                                 | 48.1                                                                                | 5.6                                                                                 |
| Cycle Q Clear(g_c), s        | 19.6                                                                              | 0.0                                                                               | 11.1                                                                              | 2.2                                                                               | 0.0                                                                               | 0.0                                                                               | 12.4                                                                               | 30.5                                                                                | 30.5                                                                                | 4.6                                                                                 | 48.1                                                                                | 5.6                                                                                 |
| Prop In Lane                 | 0.98                                                                              |                                                                                   | 1.00                                                                              | 0.57                                                                              |                                                                                   | 0.25                                                                              | 1.00                                                                               |                                                                                     | 0.02                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 327                                                                               | 0                                                                                 | 836                                                                               | 78                                                                                | 0                                                                                 | 0                                                                                 | 423                                                                                | 1052                                                                                | 1103                                                                                | 109                                                                                 | 1888                                                                                | 844                                                                                 |
| V/C Ratio(X)                 | 0.79                                                                              | 0.00                                                                              | 0.34                                                                              | 0.36                                                                              | 0.00                                                                              | 0.00                                                                              | 0.74                                                                               | 0.59                                                                                | 0.59                                                                                | 0.55                                                                                | 0.79                                                                                | 0.15                                                                                |
| Avail Cap(c_a), veh/h        | 431                                                                               | 0                                                                                 | 1000                                                                              | 384                                                                               | 0                                                                                 | 0                                                                                 | 1426                                                                               | 2452                                                                                | 2570                                                                                | 190                                                                                 | 3817                                                                                | 1707                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 54.6                                                                              | 0.0                                                                               | 38.2                                                                              | 65.2                                                                              | 0.0                                                                               | 0.0                                                                               | 59.3                                                                               | 17.7                                                                                | 17.7                                                                                | 63.8                                                                                | 26.5                                                                                | 16.6                                                                                |
| Incr Delay (d2), s/veh       | 5.4                                                                               | 0.0                                                                               | 0.1                                                                               | 1.0                                                                               | 0.0                                                                               | 0.0                                                                               | 1.0                                                                                | 0.7                                                                                 | 0.7                                                                                 | 1.6                                                                                 | 1.1                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 10.1                                                                              | 0.0                                                                               | 4.3                                                                               | 1.1                                                                               | 0.0                                                                               | 0.0                                                                               | 6.0                                                                                | 15.0                                                                                | 15.7                                                                                | 2.3                                                                                 | 23.6                                                                                | 2.5                                                                                 |
| LnGrp Delay(d),s/veh         | 60.0                                                                              | 0.0                                                                               | 38.3                                                                              | 66.3                                                                              | 0.0                                                                               | 0.0                                                                               | 60.2                                                                               | 18.4                                                                                | 18.4                                                                                | 65.4                                                                                | 27.6                                                                                | 16.7                                                                                |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | E                                                                                 |                                                                                   |                                                                                   | E                                                                                  | B                                                                                   | B                                                                                   | E                                                                                   | C                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 543                                                                               |                                                                                   |                                                                                   | 28                                                                                |                                                                                   |                                                                                    | 1581                                                                                |                                                                                     |                                                                                     | 1685                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 48.7                                                                              |                                                                                   |                                                                                   | 66.3                                                                              |                                                                                   |                                                                                    | 26.7                                                                                |                                                                                     |                                                                                     | 28.1                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                    | C                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 21.2                                                                              | 78.7                                                                              |                                                                                   | 10.3                                                                              | 12.6                                                                              | 87.3                                                                              |                                                                                    | 29.8                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 6.0                                                                               | 6.0                                                                               |                                                                                   | 7.0                                                                               | 6.0                                                                               | 6.0                                                                               |                                                                                    | 7.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 56.0                                                                              | 149.0                                                                             |                                                                                   | 28.0                                                                              | 13.0                                                                              | 192.0                                                                             |                                                                                    | 31.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 14.4                                                                              | 50.1                                                                              |                                                                                   | 4.2                                                                               | 6.6                                                                               | 32.5                                                                              |                                                                                    | 21.6                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.9                                                                               | 22.6                                                                              |                                                                                   | 0.0                                                                               | 0.0                                                                               | 12.5                                                                              |                                                                                    | 1.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 30.7                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 8: Honoapiilani Highway & Leialii Parkway

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |                                                                                     |
| Traffic Volume (veh/h)       | 5                                                                                 | 0                                                                                 | 5                                                                                 | 135                                                                               | 5                                                                                 | 60                                                                                | 5                                                                                   | 1330                                                                                | 90                                                                                  | 90                                                                                  | 1810                                                                                | 10                                                                                  |
| Future Volume (veh/h)        | 5                                                                                 | 0                                                                                 | 5                                                                                 | 135                                                                               | 5                                                                                 | 60                                                                                | 5                                                                                   | 1330                                                                                | 90                                                                                  | 90                                                                                  | 1810                                                                                | 10                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 5                                                                                 | 0                                                                                 | 1                                                                                 | 147                                                                               | 5                                                                                 | 5                                                                                 | 5                                                                                   | 1446                                                                                | 95                                                                                  | 98                                                                                  | 1967                                                                                | 11                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 194                                                                               | 5                                                                                 | 30                                                                                | 234                                                                               | 107                                                                               | 107                                                                               | 11                                                                                  | 2402                                                                                | 157                                                                                 | 124                                                                                 | 2800                                                                                | 16                                                                                  |
| Arrive On Green              | 0.13                                                                              | 0.00                                                                              | 0.12                                                                              | 0.13                                                                              | 0.13                                                                              | 0.12                                                                              | 0.01                                                                                | 0.95                                                                                | 0.94                                                                                | 0.07                                                                                | 0.78                                                                                | 0.77                                                                                |
| Sat Flow, veh/h              | 1140                                                                              | 37                                                                                | 235                                                                               | 1410                                                                              | 856                                                                               | 856                                                                               | 1774                                                                                | 3373                                                                                | 221                                                                                 | 1774                                                                                | 3609                                                                                | 20                                                                                  |
| Grp Volume(v), veh/h         | 6                                                                                 | 0                                                                                 | 0                                                                                 | 147                                                                               | 0                                                                                 | 10                                                                                | 5                                                                                   | 756                                                                                 | 785                                                                                 | 98                                                                                  | 964                                                                                 | 1014                                                                                |
| Grp Sat Flow(s),veh/h/ln     | 1412                                                                              | 0                                                                                 | 0                                                                                 | 1410                                                                              | 0                                                                                 | 1712                                                                              | 1774                                                                                | 1770                                                                                | 1824                                                                                | 1774                                                                                | 1770                                                                                | 1859                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 12.4                                                                              | 0.0                                                                               | 0.7                                                                               | 0.4                                                                                 | 6.8                                                                                 | 7.0                                                                                 | 7.1                                                                                 | 34.8                                                                                | 35.0                                                                                |
| Cycle Q Clear(g_c), s        | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 13.0                                                                              | 0.0                                                                               | 0.7                                                                               | 0.4                                                                                 | 6.8                                                                                 | 7.0                                                                                 | 7.1                                                                                 | 34.8                                                                                | 35.0                                                                                |
| Prop In Lane                 | 0.83                                                                              |                                                                                   | 0.17                                                                              | 1.00                                                                              |                                                                                   | 0.50                                                                              | 1.00                                                                                |                                                                                     | 0.12                                                                                | 1.00                                                                                |                                                                                     | 0.01                                                                                |
| Lane Grp Cap(c), veh/h       | 228                                                                               | 0                                                                                 | 0                                                                                 | 234                                                                               | 0                                                                                 | 215                                                                               | 11                                                                                  | 1260                                                                                | 1299                                                                                | 124                                                                                 | 1373                                                                                | 1443                                                                                |
| V/C Ratio(X)                 | 0.03                                                                              | 0.00                                                                              | 0.00                                                                              | 0.63                                                                              | 0.00                                                                              | 0.05                                                                              | 0.44                                                                                | 0.60                                                                                | 0.60                                                                                | 0.79                                                                                | 0.70                                                                                | 0.70                                                                                |
| Avail Cap(c_a), veh/h        | 312                                                                               | 0                                                                                 | 0                                                                                 | 318                                                                               | 0                                                                                 | 316                                                                               | 150                                                                                 | 1260                                                                                | 1299                                                                                | 150                                                                                 | 1373                                                                                | 1443                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.33                                                                                | 1.33                                                                                | 1.33                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.83                                                                                | 0.83                                                                                | 0.83                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 50.0                                                                              | 0.0                                                                               | 0.0                                                                               | 55.3                                                                              | 0.0                                                                               | 50.2                                                                              | 64.2                                                                                | 1.2                                                                                 | 1.2                                                                                 | 59.5                                                                                | 7.2                                                                                 | 7.2                                                                                 |
| Incr Delay (d2), s/veh       | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 2.8                                                                               | 0.0                                                                               | 0.1                                                                               | 8.2                                                                                 | 1.8                                                                                 | 1.7                                                                                 | 16.7                                                                                | 3.0                                                                                 | 2.9                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 5.3                                                                               | 0.0                                                                               | 0.3                                                                               | 0.2                                                                                 | 3.3                                                                                 | 3.8                                                                                 | 4.1                                                                                 | 17.7                                                                                | 18.9                                                                                |
| LnGrp Delay(d),s/veh         | 50.0                                                                              | 0.0                                                                               | 0.0                                                                               | 58.1                                                                              | 0.0                                                                               | 50.3                                                                              | 72.4                                                                                | 2.9                                                                                 | 2.9                                                                                 | 76.2                                                                                | 10.2                                                                                | 10.1                                                                                |
| LnGrp LOS                    | D                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   | D                                                                                 | E                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 6                                                                                 |                                                                                   |                                                                                   | 157                                                                               |                                                                                   |                                                                                     | 1546                                                                                |                                                                                     |                                                                                     | 2076                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 50.0                                                                              |                                                                                   |                                                                                   | 57.6                                                                              |                                                                                   |                                                                                     | 3.2                                                                                 |                                                                                     |                                                                                     | 13.3                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 4.8                                                                               | 104.9                                                                             |                                                                                   | 20.3                                                                              | 13.1                                                                              | 96.6                                                                              |                                                                                     | 20.3                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 11.0                                                                              | 82.0                                                                              |                                                                                   | 23.0                                                                              | 11.0                                                                              | 82.0                                                                              |                                                                                     | 23.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.4                                                                               | 37.0                                                                              |                                                                                   | 15.0                                                                              | 9.1                                                                               | 9.0                                                                               |                                                                                     | 2.7                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 34.6                                                                              |                                                                                   | 0.3                                                                               | 0.0                                                                               | 30.2                                                                              |                                                                                     | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   |                                                                                   | 11.0                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 9: Honoapiilani Highway & Front Street/Flemming Road

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |                                                                                   |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 135                                                                               | 5                                                                                 | 15                                                                                | 65                                                                                | 5                                                                                 | 15                                                                                | 15                                                                                  | 1275                                                                                | 15                                                                                  | 10                                                                                  | 1595                                                                                | 260                                                                                 |
| Future Volume (veh/h)        | 135                                                                               | 5                                                                                 | 15                                                                                | 65                                                                                | 5                                                                                 | 15                                                                                | 15                                                                                  | 1275                                                                                | 15                                                                                  | 10                                                                                  | 1595                                                                                | 260                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 147                                                                               | 5                                                                                 | 13                                                                                | 71                                                                                | 5                                                                                 | 9                                                                                 | 16                                                                                  | 1386                                                                                | 15                                                                                  | 11                                                                                  | 1734                                                                                | 207                                                                                 |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 0                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 228                                                                               | 6                                                                                 | 16                                                                                | 226                                                                               | 17                                                                                | 23                                                                                | 19                                                                                  | 2757                                                                                | 30                                                                                  | 13                                                                                  | 2709                                                                                | 1211                                                                                |
| Arrive On Green              | 0.13                                                                              | 0.13                                                                              | 0.12                                                                              | 0.13                                                                              | 0.13                                                                              | 0.12                                                                              | 0.01                                                                                | 0.52                                                                                | 0.51                                                                                | 0.01                                                                                | 0.77                                                                                | 0.77                                                                                |
| Sat Flow, veh/h              | 1339                                                                              | 46                                                                                | 118                                                                               | 1336                                                                              | 132                                                                               | 174                                                                               | 1774                                                                                | 3587                                                                                | 39                                                                                  | 1774                                                                                | 3539                                                                                | 1582                                                                                |
| Grp Volume(v), veh/h         | 165                                                                               | 0                                                                                 | 0                                                                                 | 85                                                                                | 0                                                                                 | 0                                                                                 | 16                                                                                  | 684                                                                                 | 717                                                                                 | 11                                                                                  | 1734                                                                                | 207                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1503                                                                              | 0                                                                                 | 0                                                                                 | 1642                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1856                                                                                | 1774                                                                                | 1770                                                                                | 1582                                                                                |
| Q Serve(g_s), s              | 7.8                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 1.2                                                                                 | 32.9                                                                                | 32.9                                                                                | 0.8                                                                                 | 29.3                                                                                | 4.6                                                                                 |
| Cycle Q Clear(g_c), s        | 13.7                                                                              | 0.0                                                                               | 0.0                                                                               | 5.9                                                                               | 0.0                                                                               | 0.0                                                                               | 1.2                                                                                 | 32.9                                                                                | 32.9                                                                                | 0.8                                                                                 | 29.3                                                                                | 4.6                                                                                 |
| Prop In Lane                 | 0.89                                                                              |                                                                                   | 0.08                                                                              | 0.84                                                                              |                                                                                   | 0.11                                                                              | 1.00                                                                                |                                                                                     | 0.02                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 250                                                                               | 0                                                                                 | 0                                                                                 | 267                                                                               | 0                                                                                 | 0                                                                                 | 19                                                                                  | 1360                                                                                | 1427                                                                                | 13                                                                                  | 2709                                                                                | 1211                                                                                |
| V/C Ratio(X)                 | 0.66                                                                              | 0.00                                                                              | 0.00                                                                              | 0.32                                                                              | 0.00                                                                              | 0.00                                                                              | 0.84                                                                                | 0.50                                                                                | 0.50                                                                                | 0.82                                                                                | 0.64                                                                                | 0.17                                                                                |
| Avail Cap(c_a), veh/h        | 347                                                                               | 0                                                                                 | 0                                                                                 | 365                                                                               | 0                                                                                 | 0                                                                                 | 109                                                                                 | 1360                                                                                | 1427                                                                                | 109                                                                                 | 2709                                                                                | 1211                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.67                                                                                | 0.67                                                                                | 0.67                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.77                                                                                | 0.77                                                                                | 0.77                                                                                | 0.62                                                                                | 0.62                                                                                | 0.62                                                                                |
| Uniform Delay (d), s/veh     | 54.8                                                                              | 0.0                                                                               | 0.0                                                                               | 51.7                                                                              | 0.0                                                                               | 0.0                                                                               | 64.4                                                                                | 15.3                                                                                | 15.3                                                                                | 64.4                                                                                | 7.0                                                                                 | 4.1                                                                                 |
| Incr Delay (d2), s/veh       | 3.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 23.5                                                                                | 1.0                                                                                 | 1.0                                                                                 | 23.6                                                                                | 0.7                                                                                 | 0.2                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 6.0                                                                               | 0.0                                                                               | 0.0                                                                               | 2.8                                                                               | 0.0                                                                               | 0.0                                                                               | 0.7                                                                                 | 16.4                                                                                | 17.2                                                                                | 0.5                                                                                 | 14.2                                                                                | 2.0                                                                                 |
| LnGrp Delay(d),s/veh         | 57.7                                                                              | 0.0                                                                               | 0.0                                                                               | 52.3                                                                              | 0.0                                                                               | 0.0                                                                               | 87.9                                                                                | 16.3                                                                                | 16.3                                                                                | 88.0                                                                                | 7.7                                                                                 | 4.3                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | F                                                                                   | B                                                                                   | B                                                                                   | F                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 165                                                                               |                                                                                   |                                                                                   | 85                                                                                |                                                                                   |                                                                                     | 1417                                                                                |                                                                                     |                                                                                     | 1952                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 57.7                                                                              |                                                                                   |                                                                                   | 52.3                                                                              |                                                                                   |                                                                                     | 17.1                                                                                |                                                                                     |                                                                                     | 7.8                                                                                 |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.4                                                                               | 103.5                                                                             |                                                                                   | 21.1                                                                              | 5.0                                                                               | 103.9                                                                             |                                                                                     | 21.1                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 8.0                                                                               | 83.0                                                                              |                                                                                   | 25.0                                                                              | 8.0                                                                               | 83.0                                                                              |                                                                                     | 25.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 3.2                                                                               | 31.3                                                                              |                                                                                   | 7.9                                                                               | 2.8                                                                               | 34.9                                                                              |                                                                                     | 15.7                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 42.2                                                                              |                                                                                   | 0.2                                                                               | 0.0                                                                               | 28.5                                                                              |                                                                                     | 0.4                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   |                                                                                   | 14.8                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 10: Honoapiilani Highway & Kapunakea Street

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |                                                                                     |  |  |                                                                                     |
| Traffic Volume (veh/h)       | 190                                                                               | 20                                                                                | 50                                                                                | 90                                                                                | 20                                                                                | 20                                                                                | 60                                                                                  | 1305                                                                                | 60                                                                                  | 15                                                                                  | 1605                                                                                | 130                                                                                 |
| Future Volume (veh/h)        | 190                                                                               | 20                                                                                | 50                                                                                | 90                                                                                | 20                                                                                | 20                                                                                | 60                                                                                  | 1305                                                                                | 60                                                                                  | 15                                                                                  | 1605                                                                                | 130                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 0.99                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 207                                                                               | 22                                                                                | 11                                                                                | 98                                                                                | 22                                                                                | 2                                                                                 | 65                                                                                  | 1418                                                                                | 63                                                                                  | 16                                                                                  | 1745                                                                                | 137                                                                                 |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 286                                                                               | 25                                                                                | 305                                                                               | 373                                                                               | 326                                                                               | 30                                                                                | 83                                                                                  | 2428                                                                                | 108                                                                                 | 19                                                                                  | 2221                                                                                | 172                                                                                 |
| Arrive On Green              | 0.19                                                                              | 0.19                                                                              | 0.19                                                                              | 0.19                                                                              | 0.19                                                                              | 0.19                                                                              | 0.06                                                                                | 0.94                                                                                | 0.93                                                                                | 0.02                                                                                | 1.00                                                                                | 1.00                                                                                |
| Sat Flow, veh/h              | 1205                                                                              | 128                                                                               | 1576                                                                              | 1380                                                                              | 1682                                                                              | 153                                                                               | 1774                                                                                | 3451                                                                                | 153                                                                                 | 1774                                                                                | 3328                                                                                | 258                                                                                 |
| Grp Volume(v), veh/h         | 229                                                                               | 0                                                                                 | 11                                                                                | 98                                                                                | 0                                                                                 | 24                                                                                | 65                                                                                  | 726                                                                                 | 755                                                                                 | 16                                                                                  | 918                                                                                 | 964                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1333                                                                              | 0                                                                                 | 1576                                                                              | 1380                                                                              | 0                                                                                 | 1835                                                                              | 1774                                                                                | 1770                                                                                | 1835                                                                                | 1774                                                                                | 1770                                                                                | 1817                                                                                |
| Q Serve(g_s), s              | 20.6                                                                              | 0.0                                                                               | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 1.4                                                                               | 4.7                                                                                 | 7.6                                                                                 | 7.7                                                                                 | 1.2                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Cycle Q Clear(g_c), s        | 22.0                                                                              | 0.0                                                                               | 0.7                                                                               | 6.5                                                                               | 0.0                                                                               | 1.4                                                                               | 4.7                                                                                 | 7.6                                                                                 | 7.7                                                                                 | 1.2                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Prop In Lane                 | 0.90                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                                |                                                                                     | 0.08                                                                                | 1.00                                                                                |                                                                                     | 0.14                                                                                |
| Lane Grp Cap(c), veh/h       | 311                                                                               | 0                                                                                 | 305                                                                               | 373                                                                               | 0                                                                                 | 355                                                                               | 83                                                                                  | 1245                                                                                | 1291                                                                                | 19                                                                                  | 1181                                                                                | 1213                                                                                |
| V/C Ratio(X)                 | 0.74                                                                              | 0.00                                                                              | 0.04                                                                              | 0.26                                                                              | 0.00                                                                              | 0.07                                                                              | 0.79                                                                                | 0.58                                                                                | 0.59                                                                                | 0.84                                                                                | 0.78                                                                                | 0.79                                                                                |
| Avail Cap(c_a), veh/h        | 331                                                                               | 0                                                                                 | 327                                                                               | 393                                                                               | 0                                                                                 | 381                                                                               | 109                                                                                 | 1245                                                                                | 1291                                                                                | 109                                                                                 | 1181                                                                                | 1213                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.33                                                                                | 1.33                                                                                | 1.33                                                                                | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.64                                                                                | 0.64                                                                                | 0.64                                                                                | 0.70                                                                                | 0.70                                                                                | 0.70                                                                                |
| Uniform Delay (d), s/veh     | 51.8                                                                              | 0.0                                                                               | 42.6                                                                              | 44.9                                                                              | 0.0                                                                               | 42.9                                                                              | 60.3                                                                                | 1.5                                                                                 | 1.5                                                                                 | 63.5                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Incr Delay (d2), s/veh       | 7.9                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.1                                                                               | 11.6                                                                                | 1.3                                                                                 | 1.2                                                                                 | 21.7                                                                                | 3.6                                                                                 | 3.8                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 8.7                                                                               | 0.0                                                                               | 0.3                                                                               | 3.1                                                                               | 0.0                                                                               | 0.7                                                                               | 2.6                                                                                 | 3.6                                                                                 | 4.0                                                                                 | 0.7                                                                                 | 1.2                                                                                 | 1.3                                                                                 |
| LnGrp Delay(d),s/veh         | 59.7                                                                              | 0.0                                                                               | 42.6                                                                              | 45.3                                                                              | 0.0                                                                               | 42.9                                                                              | 71.9                                                                                | 2.8                                                                                 | 2.8                                                                                 | 85.2                                                                                | 3.6                                                                                 | 3.8                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 |                                                                                   | D                                                                                 | E                                                                                   | A                                                                                   | A                                                                                   | F                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 240                                                                               |                                                                                   |                                                                                   | 122                                                                               |                                                                                   |                                                                                     | 1546                                                                                |                                                                                     |                                                                                     | 1898                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 58.9                                                                              |                                                                                   |                                                                                   | 44.8                                                                              |                                                                                   |                                                                                     | 5.7                                                                                 |                                                                                     |                                                                                     | 4.4                                                                                 |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 10.1                                                                              | 90.8                                                                              |                                                                                   | 29.2                                                                              | 5.4                                                                               | 95.4                                                                              |                                                                                     | 29.2                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 8.0                                                                               | 82.0                                                                              |                                                                                   | 26.0                                                                              | 8.0                                                                               | 82.0                                                                              |                                                                                     | 26.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 6.7                                                                               | 2.0                                                                               |                                                                                   | 8.5                                                                               | 3.2                                                                               | 9.7                                                                               |                                                                                     | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 47.6                                                                              |                                                                                   | 0.4                                                                               | 0.0                                                                               | 27.7                                                                              |                                                                                     | 0.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 9.7                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Notes</b>                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 11: Honoapiilani Highway & Keawe Street

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 60                                                                                | 150                                                                               | 90                                                                                | 145                                                                               | 130                                                                               | 650                                                                               | 80                                                                                  | 715                                                                                 | 195                                                                                 | 570                                                                                 | 950                                                                                 | 100                                                                                 |
| Future Volume (veh/h)        | 60                                                                                | 150                                                                               | 90                                                                                | 145                                                                               | 130                                                                               | 650                                                                               | 80                                                                                  | 715                                                                                 | 195                                                                                 | 570                                                                                 | 950                                                                                 | 100                                                                                 |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                                |                                                                                     | 0.99                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 65                                                                                | 163                                                                               | 10                                                                                | 158                                                                               | 141                                                                               | 317                                                                               | 87                                                                                  | 777                                                                                 | 127                                                                                 | 620                                                                                 | 1033                                                                                | 104                                                                                 |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   | 2                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 100                                                                               | 195                                                                               | 266                                                                               | 253                                                                               | 560                                                                               | 463                                                                               | 110                                                                                 | 1423                                                                                | 628                                                                                 | 706                                                                                 | 1771                                                                                | 178                                                                                 |
| Arrive On Green              | 0.18                                                                              | 0.18                                                                              | 0.18                                                                              | 0.09                                                                              | 0.30                                                                              | 0.30                                                                              | 0.06                                                                                | 0.40                                                                                | 0.40                                                                                | 0.07                                                                                | 0.18                                                                                | 0.18                                                                                |
| Sat Flow, veh/h              | 367                                                                               | 1109                                                                              | 1511                                                                              | 1774                                                                              | 1863                                                                              | 1541                                                                              | 1774                                                                                | 3539                                                                                | 1562                                                                                | 3442                                                                                | 3247                                                                                | 327                                                                                 |
| Grp Volume(v), veh/h         | 228                                                                               | 0                                                                                 | 10                                                                                | 158                                                                               | 141                                                                               | 317                                                                               | 87                                                                                  | 777                                                                                 | 127                                                                                 | 620                                                                                 | 563                                                                                 | 574                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1476                                                                              | 0                                                                                 | 1511                                                                              | 1774                                                                              | 1863                                                                              | 1541                                                                              | 1774                                                                                | 1770                                                                                | 1562                                                                                | 1721                                                                                | 1770                                                                                | 1805                                                                                |
| Q Serve(g_s), s              | 17.1                                                                              | 0.0                                                                               | 0.7                                                                               | 9.1                                                                               | 7.4                                                                               | 23.6                                                                              | 6.3                                                                                 | 21.9                                                                                | 6.9                                                                                 | 23.2                                                                                | 37.9                                                                                | 37.9                                                                                |
| Cycle Q Clear(g_c), s        | 19.4                                                                              | 0.0                                                                               | 0.7                                                                               | 9.1                                                                               | 7.4                                                                               | 23.6                                                                              | 6.3                                                                                 | 21.9                                                                                | 6.9                                                                                 | 23.2                                                                                | 37.9                                                                                | 37.9                                                                                |
| Prop In Lane                 | 0.29                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 0.18                                                                                |
| Lane Grp Cap(c), veh/h       | 296                                                                               | 0                                                                                 | 266                                                                               | 253                                                                               | 560                                                                               | 463                                                                               | 110                                                                                 | 1423                                                                                | 628                                                                                 | 706                                                                                 | 965                                                                                 | 984                                                                                 |
| V/C Ratio(X)                 | 0.77                                                                              | 0.00                                                                              | 0.04                                                                              | 0.62                                                                              | 0.25                                                                              | 0.68                                                                              | 0.79                                                                                | 0.55                                                                                | 0.20                                                                                | 0.88                                                                                | 0.58                                                                                | 0.58                                                                                |
| Avail Cap(c_a), veh/h        | 330                                                                               | 0                                                                                 | 302                                                                               | 279                                                                               | 630                                                                               | 521                                                                               | 328                                                                                 | 1423                                                                                | 628                                                                                 | 953                                                                                 | 965                                                                                 | 984                                                                                 |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 0.33                                                                                | 0.33                                                                                | 0.33                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.79                                                                                | 0.79                                                                                | 0.79                                                                                | 0.52                                                                                | 0.52                                                                                | 0.52                                                                                |
| Uniform Delay (d), s/veh     | 51.8                                                                              | 0.0                                                                               | 44.4                                                                              | 38.5                                                                              | 34.4                                                                              | 40.0                                                                              | 60.2                                                                                | 29.8                                                                                | 25.3                                                                                | 59.0                                                                                | 39.8                                                                                | 39.8                                                                                |
| Incr Delay (d2), s/veh       | 9.7                                                                               | 0.0                                                                               | 0.1                                                                               | 3.7                                                                               | 0.2                                                                               | 3.2                                                                               | 3.8                                                                                 | 1.2                                                                                 | 0.6                                                                                 | 3.2                                                                                 | 1.3                                                                                 | 1.3                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 8.8                                                                               | 0.0                                                                               | 0.3                                                                               | 4.6                                                                               | 3.9                                                                               | 10.4                                                                              | 3.2                                                                                 | 10.9                                                                                | 3.1                                                                                 | 11.4                                                                                | 19.0                                                                                | 19.4                                                                                |
| LnGrp Delay(d),s/veh         | 61.5                                                                              | 0.0                                                                               | 44.5                                                                              | 42.2                                                                              | 34.6                                                                              | 43.2                                                                              | 64.0                                                                                | 31.0                                                                                | 25.9                                                                                | 62.2                                                                                | 41.1                                                                                | 41.1                                                                                |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 | C                                                                                 | D                                                                                 | E                                                                                   | C                                                                                   | C                                                                                   | E                                                                                   | D                                                                                   | D                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 238                                                                               |                                                                                   |                                                                                   | 616                                                                               |                                                                                   |                                                                                     | 991                                                                                 |                                                                                     |                                                                                     | 1757                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 60.8                                                                              |                                                                                   |                                                                                   | 41.0                                                                              |                                                                                   |                                                                                     | 33.2                                                                                |                                                                                     |                                                                                     | 48.6                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                     | C                                                                                   |                                                                                     |                                                                                     | D                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 12.0                                                                              | 74.9                                                                              | 16.1                                                                              | 26.9                                                                              | 30.7                                                                              | 56.3                                                                              |                                                                                     | 43.1                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 24.0                                                                              | 49.0                                                                              | 13.0                                                                              | 25.0                                                                              | 36.0                                                                              | 37.0                                                                              |                                                                                     | 43.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 8.3                                                                               | 39.9                                                                              | 11.1                                                                              | 21.4                                                                              | 25.2                                                                              | 23.9                                                                              |                                                                                     | 25.6                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.1                                                                               | 5.9                                                                               | 0.1                                                                               | 0.3                                                                               | 1.4                                                                               | 6.5                                                                               |                                                                                     | 2.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 43.9                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Notes</b>                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



---

## **APPENDIX C**

### LEVEL OF SERVICE CALCULATIONS

- Base Year 2022 with Mitigation AM Peak
-

# HCM 2010 Signalized Intersection Summary

## 1: Honoapiilani Highway & Napilihau Street

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 50                                                                                | 45                                                                                | 295                                                                               | 90                                                                                | 50                                                                                | 20                                                                                | 220                                                                                 | 230                                                                                 | 100                                                                                 | 10                                                                                  | 135                                                                                 | 30                                                                                  |
| Future Volume (veh/h)        | 50                                                                                | 45                                                                                | 295                                                                               | 90                                                                                | 50                                                                                | 20                                                                                | 220                                                                                 | 230                                                                                 | 100                                                                                 | 10                                                                                  | 135                                                                                 | 30                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.99                                                                              | 0.99                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 54                                                                                | 49                                                                                | 42                                                                                | 98                                                                                | 54                                                                                | 11                                                                                | 239                                                                                 | 250                                                                                 | 51                                                                                  | 11                                                                                  | 147                                                                                 | 8                                                                                   |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 239                                                                               | 165                                                                               | 258                                                                               | 328                                                                               | 247                                                                               | 50                                                                                | 320                                                                                 | 789                                                                                 | 671                                                                                 | 15                                                                                  | 469                                                                                 | 399                                                                                 |
| Arrive On Green              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.18                                                                                | 0.42                                                                                | 0.42                                                                                | 0.01                                                                                | 0.25                                                                                | 0.25                                                                                |
| Sat Flow, veh/h              | 612                                                                               | 999                                                                               | 1569                                                                              | 1291                                                                              | 1500                                                                              | 306                                                                               | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 103                                                                               | 0                                                                                 | 42                                                                                | 98                                                                                | 0                                                                                 | 65                                                                                | 239                                                                                 | 250                                                                                 | 51                                                                                  | 11                                                                                  | 147                                                                                 | 8                                                                                   |
| Grp Sat Flow(s),veh/h/ln     | 1612                                                                              | 0                                                                                 | 1569                                                                              | 1291                                                                              | 0                                                                                 | 1806                                                                              | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 0.5                                                                               | 0.0                                                                               | 0.9                                                                               | 2.9                                                                               | 0.0                                                                               | 1.2                                                                               | 5.1                                                                                 | 3.5                                                                                 | 0.8                                                                                 | 0.2                                                                                 | 2.5                                                                                 | 0.2                                                                                 |
| Cycle Q Clear(g_c), s        | 2.0                                                                               | 0.0                                                                               | 0.9                                                                               | 4.9                                                                               | 0.0                                                                               | 1.2                                                                               | 5.1                                                                                 | 3.5                                                                                 | 0.8                                                                                 | 0.2                                                                                 | 2.5                                                                                 | 0.2                                                                                 |
| Prop In Lane                 | 0.52                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.17                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 404                                                                               | 0                                                                                 | 258                                                                               | 328                                                                               | 0                                                                                 | 297                                                                               | 320                                                                                 | 789                                                                                 | 671                                                                                 | 15                                                                                  | 469                                                                                 | 399                                                                                 |
| V/C Ratio(X)                 | 0.26                                                                              | 0.00                                                                              | 0.16                                                                              | 0.30                                                                              | 0.00                                                                              | 0.22                                                                              | 0.75                                                                                | 0.32                                                                                | 0.08                                                                                | 0.72                                                                                | 0.31                                                                                | 0.02                                                                                |
| Avail Cap(c_a), veh/h        | 1078                                                                              | 0                                                                                 | 948                                                                               | 896                                                                               | 0                                                                                 | 1091                                                                              | 1341                                                                                | 3706                                                                                | 3151                                                                                | 670                                                                                 | 3003                                                                                | 2552                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 14.7                                                                              | 0.0                                                                               | 14.2                                                                              | 16.9                                                                              | 0.0                                                                               | 14.4                                                                              | 15.4                                                                                | 7.6                                                                                 | 6.8                                                                                 | 19.6                                                                                | 12.1                                                                                | 11.2                                                                                |
| Incr Delay (d2), s/veh       | 0.3                                                                               | 0.0                                                                               | 0.3                                                                               | 0.5                                                                               | 0.0                                                                               | 0.4                                                                               | 3.5                                                                                 | 0.5                                                                                 | 0.1                                                                                 | 47.2                                                                                | 0.8                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.0                                                                               | 0.0                                                                               | 0.4                                                                               | 1.1                                                                               | 0.0                                                                               | 0.6                                                                               | 2.8                                                                                 | 1.9                                                                                 | 0.3                                                                                 | 0.3                                                                                 | 1.4                                                                                 | 0.1                                                                                 |
| LnGrp Delay(d),s/veh         | 15.0                                                                              | 0.0                                                                               | 14.5                                                                              | 17.4                                                                              | 0.0                                                                               | 14.7                                                                              | 18.9                                                                                | 8.1                                                                                 | 6.9                                                                                 | 66.8                                                                                | 12.9                                                                                | 11.2                                                                                |
| LnGrp LOS                    | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 145                                                                               |                                                                                   |                                                                                   | 163                                                                               |                                                                                   |                                                                                     | 540                                                                                 |                                                                                     |                                                                                     | 166                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 14.9                                                                              |                                                                                   |                                                                                   | 16.3                                                                              |                                                                                   |                                                                                     | 12.8                                                                                |                                                                                     |                                                                                     | 16.4                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.3                                                                               | 22.8                                                                              |                                                                                   | 11.5                                                                              | 12.2                                                                              | 16.0                                                                              |                                                                                     | 11.5                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 79.0                                                                              |                                                                                   | 24.0                                                                              | 30.0                                                                              | 64.0                                                                              |                                                                                     | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.2                                                                               | 5.5                                                                               |                                                                                   | 4.0                                                                               | 7.1                                                                               | 4.5                                                                               |                                                                                     | 6.9                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 3.7                                                                               |                                                                                   | 0.6                                                                               | 0.7                                                                               | 1.8                                                                               |                                                                                     | 0.6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 14.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## HCM 2010 Signalized Intersection Summary

### 2: Honoapiilani Highway & Hoohui Road

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 60                                                                                | 5                                                                                 | 180                                                                               | 90                                                                                | 20                                                                                | 15                                                                                | 135                                                                                 | 515                                                                                 | 15                                                                                  | 10                                                                                  | 515                                                                                 | 65                                                                                  |
| Future Volume (veh/h)        | 60                                                                                | 5                                                                                 | 180                                                                               | 90                                                                                | 20                                                                                | 15                                                                                | 135                                                                                 | 515                                                                                 | 15                                                                                  | 10                                                                                  | 515                                                                                 | 65                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                              |                                                                                   | 0.97                                                                              | 0.98                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 0.99                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 65                                                                                | 5                                                                                 | 20                                                                                | 98                                                                                | 22                                                                                | 2                                                                                 | 147                                                                                 | 560                                                                                 | 0                                                                                   | 11                                                                                  | 560                                                                                 | 28                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 381                                                                               | 24                                                                                | 309                                                                               | 347                                                                               | 336                                                                               | 31                                                                                | 409                                                                                 | 878                                                                                 | 746                                                                                 | 365                                                                                 | 725                                                                                 | 612                                                                                 |
| Arrive On Green              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.09                                                                                | 0.47                                                                                | 0.00                                                                                | 0.01                                                                                | 0.39                                                                                | 0.39                                                                                |
| Sat Flow, veh/h              | 1209                                                                              | 122                                                                               | 1544                                                                              | 1351                                                                              | 1679                                                                              | 153                                                                               | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1571                                                                                |
| Grp Volume(v), veh/h         | 70                                                                                | 0                                                                                 | 20                                                                                | 98                                                                                | 0                                                                                 | 24                                                                                | 147                                                                                 | 560                                                                                 | 0                                                                                   | 11                                                                                  | 560                                                                                 | 28                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1331                                                                              | 0                                                                                 | 1544                                                                              | 1351                                                                              | 0                                                                                 | 1831                                                                              | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1571                                                                                |
| Q Serve(g_s), s              | 1.9                                                                               | 0.0                                                                               | 0.5                                                                               | 3.3                                                                               | 0.0                                                                               | 0.5                                                                               | 2.2                                                                                 | 11.3                                                                                | 0.0                                                                                 | 0.2                                                                                 | 13.1                                                                                | 0.6                                                                                 |
| Cycle Q Clear(g_c), s        | 2.5                                                                               | 0.0                                                                               | 0.5                                                                               | 5.8                                                                               | 0.0                                                                               | 0.5                                                                               | 2.2                                                                                 | 11.3                                                                                | 0.0                                                                                 | 0.2                                                                                 | 13.1                                                                                | 0.6                                                                                 |
| Prop In Lane                 | 0.93                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 405                                                                               | 0                                                                                 | 309                                                                               | 347                                                                               | 0                                                                                 | 366                                                                               | 409                                                                                 | 878                                                                                 | 746                                                                                 | 365                                                                                 | 725                                                                                 | 612                                                                                 |
| V/C Ratio(X)                 | 0.17                                                                              | 0.00                                                                              | 0.06                                                                              | 0.28                                                                              | 0.00                                                                              | 0.07                                                                              | 0.36                                                                                | 0.64                                                                                | 0.00                                                                                | 0.03                                                                                | 0.77                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h        | 819                                                                               | 0                                                                                 | 773                                                                               | 754                                                                               | 0                                                                                 | 917                                                                               | 782                                                                                 | 1903                                                                                | 1618                                                                                | 883                                                                                 | 1903                                                                                | 1605                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 0.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 17.1                                                                              | 0.0                                                                               | 16.2                                                                              | 19.4                                                                              | 0.0                                                                               | 16.2                                                                              | 9.2                                                                                 | 10.0                                                                                | 0.0                                                                                 | 9.6                                                                                 | 13.3                                                                                | 9.5                                                                                 |
| Incr Delay (d2), s/veh       | 0.2                                                                               | 0.0                                                                               | 0.1                                                                               | 0.4                                                                               | 0.0                                                                               | 0.1                                                                               | 0.5                                                                                 | 0.8                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 1.8                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.8                                                                               | 0.0                                                                               | 0.2                                                                               | 1.3                                                                               | 0.0                                                                               | 0.3                                                                               | 1.1                                                                                 | 5.9                                                                                 | 0.0                                                                                 | 0.1                                                                                 | 7.0                                                                                 | 0.2                                                                                 |
| LnGrp Delay(d),s/veh         | 17.3                                                                              | 0.0                                                                               | 16.3                                                                              | 19.9                                                                              | 0.0                                                                               | 16.3                                                                              | 9.8                                                                                 | 10.8                                                                                | 0.0                                                                                 | 9.7                                                                                 | 15.1                                                                                | 9.5                                                                                 |
| LnGrp LOS                    | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                 |                                                                                   | B                                                                                 | A                                                                                   | B                                                                                   |                                                                                     | A                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 90                                                                                |                                                                                   |                                                                                   | 122                                                                               |                                                                                   |                                                                                     | 707                                                                                 |                                                                                     |                                                                                     | 599                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 17.1                                                                              |                                                                                   |                                                                                   | 19.2                                                                              |                                                                                   |                                                                                     | 10.6                                                                                |                                                                                     |                                                                                     | 14.7                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.4                                                                               | 29.5                                                                              |                                                                                   | 15.0                                                                              | 9.5                                                                               | 25.4                                                                              |                                                                                     | 15.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 51.0                                                                              |                                                                                   | 25.0                                                                              | 15.0                                                                              | 51.0                                                                              |                                                                                     | 25.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.2                                                                               | 13.3                                                                              |                                                                                   | 4.5                                                                               | 4.2                                                                               | 15.1                                                                              |                                                                                     | 7.8                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 4.0                                                                               |                                                                                   | 0.4                                                                               | 0.3                                                                               | 4.1                                                                               |                                                                                     | 0.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 13.3                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 3: Honoapiilani Highway & Akahele Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 40                                                                                | 5                                                                                 | 125                                                                               | 5                                                                                 | 5                                                                                 | 5                                                                                 | 60                                                                                 | 600                                                                                 | 15                                                                                  | 5                                                                                   | 715                                                                                 | 30                                                                                  |
| Future Volume (veh/h)        | 40                                                                                | 5                                                                                 | 125                                                                               | 5                                                                                 | 5                                                                                 | 5                                                                                 | 60                                                                                 | 600                                                                                 | 15                                                                                  | 5                                                                                   | 715                                                                                 | 30                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                  | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 0.99                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 43                                                                                | 5                                                                                 | 11                                                                                | 5                                                                                 | 5                                                                                 | 1                                                                                 | 65                                                                                 | 652                                                                                 | 9                                                                                   | 5                                                                                   | 777                                                                                 | 17                                                                                  |
| Adj No. of Lanes             | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 60                                                                                | 63                                                                                | 139                                                                               | 9                                                                                 | 175                                                                               | 147                                                                               | 84                                                                                 | 1010                                                                                | 858                                                                                 | 7                                                                                   | 929                                                                                 | 784                                                                                 |
| Arrive On Green              | 0.03                                                                              | 0.12                                                                              | 0.12                                                                              | 0.01                                                                              | 0.09                                                                              | 0.09                                                                              | 0.05                                                                               | 0.54                                                                                | 0.54                                                                                | 0.00                                                                                | 0.50                                                                                | 0.50                                                                                |
| Sat Flow, veh/h              | 1774                                                                              | 515                                                                               | 1132                                                                              | 1774                                                                              | 1863                                                                              | 1564                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1572                                                                                |
| Grp Volume(v), veh/h         | 43                                                                                | 0                                                                                 | 16                                                                                | 5                                                                                 | 5                                                                                 | 1                                                                                 | 65                                                                                 | 652                                                                                 | 9                                                                                   | 5                                                                                   | 777                                                                                 | 17                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1774                                                                              | 0                                                                                 | 1646                                                                              | 1774                                                                              | 1863                                                                              | 1564                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1572                                                                                |
| Q Serve(g_s), s              | 1.5                                                                               | 0.0                                                                               | 0.5                                                                               | 0.2                                                                               | 0.1                                                                               | 0.0                                                                               | 2.2                                                                                | 15.1                                                                                | 0.2                                                                                 | 0.2                                                                                 | 22.0                                                                                | 0.3                                                                                 |
| Cycle Q Clear(g_c), s        | 1.5                                                                               | 0.0                                                                               | 0.5                                                                               | 0.2                                                                               | 0.1                                                                               | 0.0                                                                               | 2.2                                                                                | 15.1                                                                                | 0.2                                                                                 | 0.2                                                                                 | 22.0                                                                                | 0.3                                                                                 |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 0.69                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 60                                                                                | 0                                                                                 | 202                                                                               | 9                                                                                 | 175                                                                               | 147                                                                               | 84                                                                                 | 1010                                                                                | 858                                                                                 | 7                                                                                   | 929                                                                                 | 784                                                                                 |
| V/C Ratio(X)                 | 0.72                                                                              | 0.00                                                                              | 0.08                                                                              | 0.53                                                                              | 0.03                                                                              | 0.01                                                                              | 0.77                                                                               | 0.65                                                                                | 0.01                                                                                | 0.71                                                                                | 0.84                                                                                | 0.02                                                                                |
| Avail Cap(c_a), veh/h        | 578                                                                               | 0                                                                                 | 563                                                                               | 578                                                                               | 637                                                                               | 535                                                                               | 723                                                                                | 1973                                                                                | 1677                                                                                | 723                                                                                 | 1973                                                                                | 1665                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 29.4                                                                              | 0.0                                                                               | 23.9                                                                              | 30.4                                                                              | 25.3                                                                              | 25.2                                                                              | 28.9                                                                               | 9.9                                                                                 | 6.5                                                                                 | 30.5                                                                                | 13.2                                                                                | 7.8                                                                                 |
| Incr Delay (d2), s/veh       | 14.6                                                                              | 0.0                                                                               | 0.2                                                                               | 39.1                                                                              | 0.1                                                                               | 0.0                                                                               | 13.8                                                                               | 0.7                                                                                 | 0.0                                                                                 | 81.5                                                                                | 2.1                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.0                                                                               | 0.0                                                                               | 0.2                                                                               | 0.2                                                                               | 0.1                                                                               | 0.0                                                                               | 1.4                                                                                | 7.8                                                                                 | 0.1                                                                                 | 0.2                                                                                 | 11.8                                                                                | 0.1                                                                                 |
| LnGrp Delay(d),s/veh         | 44.0                                                                              | 0.0                                                                               | 24.0                                                                              | 69.5                                                                              | 25.3                                                                              | 25.2                                                                              | 42.7                                                                               | 10.6                                                                                | 6.5                                                                                 | 112.0                                                                               | 15.3                                                                                | 7.8                                                                                 |
| LnGrp LOS                    | D                                                                                 |                                                                                   | C                                                                                 | E                                                                                 | C                                                                                 | C                                                                                 | D                                                                                  | B                                                                                   | A                                                                                   | F                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 59                                                                                |                                                                                   |                                                                                   | 11                                                                                |                                                                                   |                                                                                   | 726                                                                                |                                                                                     |                                                                                     | 799                                                                                 |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 38.6                                                                              |                                                                                   |                                                                                   | 45.4                                                                              |                                                                                   |                                                                                   | 13.4                                                                               |                                                                                     |                                                                                     | 15.8                                                                                |                                                                                     |                                                                                     |
| Approach LOS                 | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | B                                                                                  |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.2                                                                               | 38.3                                                                              | 5.3                                                                               | 12.5                                                                              | 7.9                                                                               | 35.6                                                                              | 7.1                                                                                | 10.8                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              | 25.0                                                                              | 65.0                                                                              | 20.0                                                                               | 21.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.2                                                                               | 17.1                                                                              | 2.2                                                                               | 2.5                                                                               | 4.2                                                                               | 24.0                                                                              | 3.5                                                                                | 2.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 5.1                                                                               | 0.0                                                                               | 0.0                                                                               | 0.1                                                                               | 6.6                                                                               | 0.1                                                                                | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          | 15.7                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 4: Honoapiilani Highway & Lower Honoapiilani Road

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 35                                                                                | 10                                                                                | 480                                                                               | 20                                                                                | 5                                                                                 | 0                                                                                 | 315                                                                                 | 675                                                                                 | 45                                                                                  | 10                                                                                  | 805                                                                                 | 10                                                                                  |
| Future Volume (veh/h)        | 35                                                                                | 10                                                                                | 480                                                                               | 20                                                                                | 5                                                                                 | 0                                                                                 | 315                                                                                 | 675                                                                                 | 45                                                                                  | 10                                                                                  | 805                                                                                 | 10                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 1.00                                                                              | 0.99                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 38                                                                                | 11                                                                                | 0                                                                                 | 22                                                                                | 5                                                                                 | 0                                                                                 | 342                                                                                 | 734                                                                                 | 48                                                                                  | 11                                                                                  | 875                                                                                 | 3                                                                                   |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 195                                                                               | 31                                                                                | 117                                                                               | 200                                                                               | 31                                                                                | 0                                                                                 | 411                                                                                 | 2202                                                                                | 144                                                                                 | 15                                                                                  | 1521                                                                                | 680                                                                                 |
| Arrive On Green              | 0.09                                                                              | 0.07                                                                              | 0.00                                                                              | 0.09                                                                              | 0.07                                                                              | 0.00                                                                              | 0.23                                                                                | 0.65                                                                                | 0.65                                                                                | 0.01                                                                                | 0.43                                                                                | 0.43                                                                                |
| Sat Flow, veh/h              | 1112                                                                              | 417                                                                               | 1583                                                                              | 1143                                                                              | 422                                                                               | 0                                                                                 | 1774                                                                                | 3373                                                                                | 220                                                                                 | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 49                                                                                | 0                                                                                 | 0                                                                                 | 27                                                                                | 0                                                                                 | 0                                                                                 | 342                                                                                 | 385                                                                                 | 397                                                                                 | 11                                                                                  | 875                                                                                 | 3                                                                                   |
| Grp Sat Flow(s),veh/h/ln     | 1530                                                                              | 0                                                                                 | 1583                                                                              | 1565                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1824                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 10.4                                                                                | 5.5                                                                                 | 5.5                                                                                 | 0.3                                                                                 | 10.6                                                                                | 0.1                                                                                 |
| Cycle Q Clear(g_c), s        | 1.6                                                                               | 0.0                                                                               | 0.0                                                                               | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 10.4                                                                                | 5.5                                                                                 | 5.5                                                                                 | 0.3                                                                                 | 10.6                                                                                | 0.1                                                                                 |
| Prop In Lane                 | 0.78                                                                              |                                                                                   | 1.00                                                                              | 0.81                                                                              |                                                                                   | 0.00                                                                              | 1.00                                                                                |                                                                                     | 0.12                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 253                                                                               | 0                                                                                 | 117                                                                               | 258                                                                               | 0                                                                                 | 0                                                                                 | 411                                                                                 | 1155                                                                                | 1190                                                                                | 15                                                                                  | 1521                                                                                | 680                                                                                 |
| V/C Ratio(X)                 | 0.19                                                                              | 0.00                                                                              | 0.00                                                                              | 0.10                                                                              | 0.00                                                                              | 0.00                                                                              | 0.83                                                                                | 0.33                                                                                | 0.33                                                                                | 0.74                                                                                | 0.58                                                                                | 0.00                                                                                |
| Avail Cap(c_a), veh/h        | 667                                                                               | 0                                                                                 | 560                                                                               | 796                                                                               | 0                                                                                 | 0                                                                                 | 2070                                                                                | 2315                                                                                | 2386                                                                                | 2070                                                                                | 4631                                                                                | 2072                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 24.6                                                                              | 0.0                                                                               | 0.0                                                                               | 24.2                                                                              | 0.0                                                                               | 0.0                                                                               | 20.7                                                                                | 4.4                                                                                 | 4.4                                                                                 | 28.0                                                                                | 12.2                                                                                | 9.2                                                                                 |
| Incr Delay (d2), s/veh       | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 1.7                                                                                 | 0.4                                                                                 | 0.3                                                                                 | 22.7                                                                                | 0.7                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 5.2                                                                                 | 2.7                                                                                 | 2.8                                                                                 | 0.3                                                                                 | 5.3                                                                                 | 0.0                                                                                 |
| LnGrp Delay(d),s/veh         | 25.0                                                                              | 0.0                                                                               | 0.0                                                                               | 24.4                                                                              | 0.0                                                                               | 0.0                                                                               | 22.4                                                                                | 4.7                                                                                 | 4.7                                                                                 | 50.7                                                                                | 13.0                                                                                | 9.2                                                                                 |
| LnGrp LOS                    | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                   | A                                                                                   | A                                                                                   | D                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 49                                                                                |                                                                                   |                                                                                   | 27                                                                                |                                                                                   |                                                                                     | 1124                                                                                |                                                                                     |                                                                                     | 889                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 25.0                                                                              |                                                                                   |                                                                                   | 24.4                                                                              |                                                                                   |                                                                                     | 10.1                                                                                |                                                                                     |                                                                                     | 13.4                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 17.1                                                                              | 30.3                                                                              |                                                                                   | 9.2                                                                               | 4.5                                                                               | 42.9                                                                              |                                                                                     | 9.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 66.0                                                                              | 74.0                                                                              |                                                                                   | 25.0                                                                              | 66.0                                                                              | 74.0                                                                              |                                                                                     | 20.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 12.4                                                                              | 12.6                                                                              |                                                                                   | 2.8                                                                               | 2.3                                                                               | 7.5                                                                               |                                                                                     | 3.6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.8                                                                               | 11.7                                                                              |                                                                                   | 0.0                                                                               | 0.0                                                                               | 9.0                                                                               |                                                                                     | 0.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 12.0                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 5: Honoapiilani Highway & Kai Malina Parkway/Halawai Drive

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 30                                                                                | 0                                                                                 | 70                                                                                | 10                                                                                | 5                                                                                 | 10                                                                                | 135                                                                                 | 1085                                                                                | 20                                                                                  | 15                                                                                  | 1275                                                                                | 65                                                                                  |
| Future Volume (veh/h)        | 30                                                                                | 0                                                                                 | 70                                                                                | 10                                                                                | 5                                                                                 | 10                                                                                | 135                                                                                 | 1085                                                                                | 20                                                                                  | 15                                                                                  | 1275                                                                                | 65                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 33                                                                                | 0                                                                                 | 1                                                                                 | 11                                                                                | 5                                                                                 | 1                                                                                 | 147                                                                                 | 1179                                                                                | 21                                                                                  | 16                                                                                  | 1386                                                                                | 38                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 180                                                                               | 0                                                                                 | 73                                                                                | 121                                                                               | 19                                                                                | 3                                                                                 | 186                                                                                 | 2603                                                                                | 46                                                                                  | 20                                                                                  | 2259                                                                                | 1011                                                                                |
| Arrive On Green              | 0.06                                                                              | 0.00                                                                              | 0.05                                                                              | 0.06                                                                              | 0.05                                                                              | 0.05                                                                              | 0.10                                                                                | 0.73                                                                                | 0.73                                                                                | 0.01                                                                                | 0.64                                                                                | 0.64                                                                                |
| Sat Flow, veh/h              | 1553                                                                              | 0                                                                                 | 1583                                                                              | 701                                                                               | 414                                                                               | 70                                                                                | 1774                                                                                | 3558                                                                                | 63                                                                                  | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 33                                                                                | 0                                                                                 | 1                                                                                 | 17                                                                                | 0                                                                                 | 0                                                                                 | 147                                                                                 | 586                                                                                 | 614                                                                                 | 16                                                                                  | 1386                                                                                | 38                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1553                                                                              | 0                                                                                 | 1583                                                                              | 1185                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1852                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 5.4                                                                                 | 8.8                                                                                 | 8.8                                                                                 | 0.6                                                                                 | 15.5                                                                                | 0.6                                                                                 |
| Cycle Q Clear(g_c), s        | 1.2                                                                               | 0.0                                                                               | 0.0                                                                               | 1.6                                                                               | 0.0                                                                               | 0.0                                                                               | 5.4                                                                                 | 8.8                                                                                 | 8.8                                                                                 | 0.6                                                                                 | 15.5                                                                                | 0.6                                                                                 |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.65                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                                |                                                                                     | 0.03                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 203                                                                               | 0                                                                                 | 73                                                                                | 162                                                                               | 0                                                                                 | 0                                                                                 | 186                                                                                 | 1295                                                                                | 1355                                                                                | 20                                                                                  | 2259                                                                                | 1011                                                                                |
| V/C Ratio(X)                 | 0.16                                                                              | 0.00                                                                              | 0.01                                                                              | 0.11                                                                              | 0.00                                                                              | 0.00                                                                              | 0.79                                                                                | 0.45                                                                                | 0.45                                                                                | 0.78                                                                                | 0.61                                                                                | 0.04                                                                                |
| Avail Cap(c_a), veh/h        | 625                                                                               | 0                                                                                 | 548                                                                               | 621                                                                               | 0                                                                                 | 0                                                                                 | 561                                                                                 | 2292                                                                                | 2398                                                                                | 294                                                                                 | 4050                                                                                | 1812                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 30.3                                                                              | 0.0                                                                               | 30.2                                                                              | 30.8                                                                              | 0.0                                                                               | 0.0                                                                               | 29.0                                                                                | 3.6                                                                                 | 3.6                                                                                 | 32.7                                                                                | 7.1                                                                                 | 4.4                                                                                 |
| Incr Delay (d2), s/veh       | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 2.8                                                                                 | 0.5                                                                                 | 0.5                                                                                 | 20.7                                                                                | 0.6                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.6                                                                               | 0.0                                                                               | 0.0                                                                               | 0.3                                                                               | 0.0                                                                               | 0.0                                                                               | 2.8                                                                                 | 4.4                                                                                 | 4.6                                                                                 | 0.4                                                                                 | 7.5                                                                                 | 0.3                                                                                 |
| LnGrp Delay(d),s/veh         | 30.4                                                                              | 0.0                                                                               | 30.3                                                                              | 30.9                                                                              | 0.0                                                                               | 0.0                                                                               | 31.8                                                                                | 4.1                                                                                 | 4.1                                                                                 | 53.5                                                                                | 7.7                                                                                 | 4.5                                                                                 |
| LnGrp LOS                    | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                 |                                                                                   |                                                                                   | C                                                                                   | A                                                                                   | A                                                                                   | D                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 34                                                                                |                                                                                   |                                                                                   | 17                                                                                |                                                                                   |                                                                                     | 1347                                                                                |                                                                                     |                                                                                     | 1440                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 30.4                                                                              |                                                                                   |                                                                                   | 30.9                                                                              |                                                                                   |                                                                                     | 7.1                                                                                 |                                                                                     |                                                                                     | 8.1                                                                                 |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 11.0                                                                              | 47.4                                                                              |                                                                                   | 8.0                                                                               | 4.8                                                                               | 53.6                                                                              |                                                                                     | 8.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 21.0                                                                              | 76.0                                                                              |                                                                                   | 23.0                                                                              | 11.0                                                                              | 86.0                                                                              |                                                                                     | 23.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 7.4                                                                               | 17.5                                                                              |                                                                                   | 3.6                                                                               | 2.6                                                                               | 10.8                                                                              |                                                                                     | 3.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.1                                                                               | 24.9                                                                              |                                                                                   | 0.0                                                                               | 0.0                                                                               | 18.3                                                                              |                                                                                     | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 8.1                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 6: Honoapiilani Highway & Kai Ala Drive/Puukolii Road

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 55                                                                                | 5                                                                                 | 35                                                                                | 40                                                                                | 15                                                                                | 45                                                                                | 110                                                                                 | 1225                                                                                | 60                                                                                  | 25                                                                                  | 1225                                                                                | 45                                                                                  |
| Future Volume (veh/h)        | 55                                                                                | 5                                                                                 | 35                                                                                | 40                                                                                | 15                                                                                | 45                                                                                | 110                                                                                 | 1225                                                                                | 60                                                                                  | 25                                                                                  | 1225                                                                                | 45                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 60                                                                                | 5                                                                                 | 1                                                                                 | 43                                                                                | 16                                                                                | 1                                                                                 | 120                                                                                 | 1332                                                                                | 50                                                                                  | 27                                                                                  | 1332                                                                                | 35                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 160                                                                               | 12                                                                                | 153                                                                               | 111                                                                               | 168                                                                               | 10                                                                                | 142                                                                                 | 2776                                                                                | 1242                                                                                | 39                                                                                  | 2571                                                                                | 1150                                                                                |
| Arrive On Green              | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.08                                                                                | 0.78                                                                                | 0.78                                                                                | 0.02                                                                                | 0.73                                                                                | 0.73                                                                                |
| Sat Flow, veh/h              | 1193                                                                              | 120                                                                               | 1578                                                                              | 1401                                                                              | 1735                                                                              | 108                                                                               | 1774                                                                                | 3539                                                                                | 1583                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 65                                                                                | 0                                                                                 | 1                                                                                 | 43                                                                                | 0                                                                                 | 17                                                                                | 120                                                                                 | 1332                                                                                | 50                                                                                  | 27                                                                                  | 1332                                                                                | 35                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1313                                                                              | 0                                                                                 | 1578                                                                              | 1401                                                                              | 0                                                                                 | 1843                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 6.6                                                                               | 0.0                                                                               | 0.1                                                                               | 4.7                                                                               | 0.0                                                                               | 1.3                                                                               | 10.3                                                                                | 20.2                                                                                | 1.1                                                                                 | 2.3                                                                                 | 25.6                                                                                | 1.0                                                                                 |
| Cycle Q Clear(g_c), s        | 7.9                                                                               | 0.0                                                                               | 0.1                                                                               | 12.5                                                                              | 0.0                                                                               | 1.3                                                                               | 10.3                                                                                | 20.2                                                                                | 1.1                                                                                 | 2.3                                                                                 | 25.6                                                                                | 1.0                                                                                 |
| Prop In Lane                 | 0.92                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 172                                                                               | 0                                                                                 | 153                                                                               | 111                                                                               | 0                                                                                 | 178                                                                               | 142                                                                                 | 2776                                                                                | 1242                                                                                | 39                                                                                  | 2571                                                                                | 1150                                                                                |
| V/C Ratio(X)                 | 0.38                                                                              | 0.00                                                                              | 0.01                                                                              | 0.39                                                                              | 0.00                                                                              | 0.10                                                                              | 0.85                                                                                | 0.48                                                                                | 0.04                                                                                | 0.69                                                                                | 0.52                                                                                | 0.03                                                                                |
| Avail Cap(c_a), veh/h        | 254                                                                               | 0                                                                                 | 244                                                                               | 192                                                                               | 0                                                                                 | 285                                                                               | 240                                                                                 | 2776                                                                                | 1242                                                                                | 240                                                                                 | 2571                                                                                | 1150                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.71                                                                                | 0.71                                                                                | 0.71                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 67.3                                                                              | 0.0                                                                               | 63.3                                                                              | 72.8                                                                              | 0.0                                                                               | 63.8                                                                              | 70.4                                                                                | 5.8                                                                                 | 3.7                                                                                 | 75.2                                                                                | 9.3                                                                                 | 5.9                                                                                 |
| Incr Delay (d2), s/veh       | 1.4                                                                               | 0.0                                                                               | 0.0                                                                               | 2.2                                                                               | 0.0                                                                               | 0.2                                                                               | 3.8                                                                                 | 0.4                                                                                 | 0.0                                                                                 | 7.6                                                                                 | 0.7                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 2.7                                                                               | 0.0                                                                               | 0.0                                                                               | 1.9                                                                               | 0.0                                                                               | 0.7                                                                               | 5.2                                                                                 | 10.0                                                                                | 0.5                                                                                 | 1.2                                                                                 | 12.7                                                                                | 0.4                                                                                 |
| LnGrp Delay(d),s/veh         | 68.7                                                                              | 0.0                                                                               | 63.3                                                                              | 75.0                                                                              | 0.0                                                                               | 64.1                                                                              | 74.1                                                                                | 6.2                                                                                 | 3.8                                                                                 | 82.9                                                                                | 10.0                                                                                | 6.0                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                   | A                                                                                   | A                                                                                   | F                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 66                                                                                |                                                                                   |                                                                                   | 60                                                                                |                                                                                   |                                                                                     | 1502                                                                                |                                                                                     |                                                                                     | 1394                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 68.6                                                                              |                                                                                   |                                                                                   | 71.9                                                                              |                                                                                   |                                                                                     | 11.5                                                                                |                                                                                     |                                                                                     | 11.3                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 16.4                                                                              | 118.6                                                                             |                                                                                   | 20.0                                                                              | 7.4                                                                               | 127.6                                                                             |                                                                                     | 20.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 21.0                                                                              | 95.0                                                                              |                                                                                   | 24.0                                                                              | 21.0                                                                              | 95.0                                                                              |                                                                                     | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 12.3                                                                              | 27.6                                                                              |                                                                                   | 14.5                                                                              | 4.3                                                                               | 22.2                                                                              |                                                                                     | 9.9                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.1                                                                               | 24.4                                                                              |                                                                                   | 0.1                                                                               | 0.0                                                                               | 25.2                                                                              |                                                                                     | 0.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 13.9                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 7: Honoapiilani Highway & Kaanapali Parkway/Halelo Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |  |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 135                                                                               | 10                                                                                | 220                                                                               | 10                                                                                | 10                                                                                | 10                                                                                | 425                                                                                | 1310                                                                                | 15                                                                                  | 80                                                                                  | 1185                                                                                | 95                                                                                  |
| Future Volume (veh/h)        | 135                                                                               | 10                                                                                | 220                                                                               | 10                                                                                | 10                                                                                | 10                                                                                | 425                                                                                | 1310                                                                                | 15                                                                                  | 80                                                                                  | 1185                                                                                | 95                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 155                                                                               | 0                                                                                 | 64                                                                                | 11                                                                                | 11                                                                                | 4                                                                                 | 462                                                                                | 1424                                                                                | 16                                                                                  | 87                                                                                  | 1288                                                                                | 73                                                                                  |
| Adj No. of Lanes             | 2                                                                                 | 0                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 2                                                                                  | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 341                                                                               | 0                                                                                 | 832                                                                               | 61                                                                                | 61                                                                                | 22                                                                                | 616                                                                                | 2079                                                                                | 23                                                                                  | 154                                                                                 | 1726                                                                                | 906                                                                                 |
| Arrive On Green              | 0.10                                                                              | 0.00                                                                              | 0.09                                                                              | 0.08                                                                              | 0.08                                                                              | 0.05                                                                              | 0.18                                                                               | 0.58                                                                                | 0.56                                                                                | 0.09                                                                                | 0.49                                                                                | 0.49                                                                                |
| Sat Flow, veh/h              | 3548                                                                              | 0                                                                                 | 3075                                                                              | 749                                                                               | 749                                                                               | 272                                                                               | 3442                                                                               | 3585                                                                                | 40                                                                                  | 1774                                                                                | 3539                                                                                | 1577                                                                                |
| Grp Volume(v), veh/h         | 155                                                                               | 0                                                                                 | 64                                                                                | 26                                                                                | 0                                                                                 | 0                                                                                 | 462                                                                                | 703                                                                                 | 737                                                                                 | 87                                                                                  | 1288                                                                                | 73                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1774                                                                              | 0                                                                                 | 1537                                                                              | 1770                                                                              | 0                                                                                 | 0                                                                                 | 1721                                                                               | 1770                                                                                | 1856                                                                                | 1774                                                                                | 1770                                                                                | 1577                                                                                |
| Q Serve(g_s), s              | 4.2                                                                               | 0.0                                                                               | 1.6                                                                               | 1.4                                                                               | 0.0                                                                               | 0.0                                                                               | 13.1                                                                               | 28.4                                                                                | 28.4                                                                                | 4.8                                                                                 | 30.1                                                                                | 2.1                                                                                 |
| Cycle Q Clear(g_c), s        | 4.2                                                                               | 0.0                                                                               | 1.6                                                                               | 1.4                                                                               | 0.0                                                                               | 0.0                                                                               | 13.1                                                                               | 28.4                                                                                | 28.4                                                                                | 4.8                                                                                 | 30.1                                                                                | 2.1                                                                                 |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.42                                                                              |                                                                                   | 0.15                                                                              | 1.00                                                                               |                                                                                     | 0.02                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 341                                                                               | 0                                                                                 | 832                                                                               | 144                                                                               | 0                                                                                 | 0                                                                                 | 616                                                                                | 1026                                                                                | 1076                                                                                | 154                                                                                 | 1726                                                                                | 906                                                                                 |
| V/C Ratio(X)                 | 0.46                                                                              | 0.00                                                                              | 0.08                                                                              | 0.18                                                                              | 0.00                                                                              | 0.00                                                                              | 0.75                                                                               | 0.68                                                                                | 0.69                                                                                | 0.57                                                                                | 0.75                                                                                | 0.08                                                                                |
| Avail Cap(c_a), veh/h        | 1176                                                                              | 0                                                                                 | 1555                                                                              | 535                                                                               | 0                                                                                 | 0                                                                                 | 1945                                                                               | 3346                                                                                | 3509                                                                                | 259                                                                                 | 5208                                                                                | 2458                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 43.8                                                                              | 0.0                                                                               | 28.3                                                                              | 44.1                                                                              | 0.0                                                                               | 0.0                                                                               | 40.0                                                                               | 15.0                                                                                | 15.0                                                                                | 45.0                                                                                | 21.2                                                                                | 9.8                                                                                 |
| Incr Delay (d2), s/veh       | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 0.6                                                                               | 0.0                                                                               | 0.0                                                                               | 0.7                                                                                | 1.2                                                                                 | 1.1                                                                                 | 1.2                                                                                 | 0.9                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 2.1                                                                               | 0.0                                                                               | 0.7                                                                               | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 6.3                                                                                | 14.0                                                                                | 14.9                                                                                | 2.4                                                                                 | 14.9                                                                                | 1.1                                                                                 |
| LnGrp Delay(d),s/veh         | 44.2                                                                              | 0.0                                                                               | 28.3                                                                              | 44.7                                                                              | 0.0                                                                               | 0.0                                                                               | 40.7                                                                               | 16.2                                                                                | 16.2                                                                                | 46.2                                                                                | 22.1                                                                                | 9.8                                                                                 |
| LnGrp LOS                    | D                                                                                 |                                                                                   | C                                                                                 | D                                                                                 |                                                                                   |                                                                                   | D                                                                                  | B                                                                                   | B                                                                                   | D                                                                                   | C                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 219                                                                               |                                                                                   |                                                                                   | 26                                                                                |                                                                                   |                                                                                   | 1902                                                                               |                                                                                     |                                                                                     | 1448                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 39.6                                                                              |                                                                                   |                                                                                   | 44.7                                                                              |                                                                                   |                                                                                   | 22.1                                                                               |                                                                                     |                                                                                     | 22.9                                                                                |                                                                                     |                                                                                     |
| Approach LOS                 | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | C                                                                                  |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 22.4                                                                              | 54.0                                                                              |                                                                                   | 12.4                                                                              | 12.9                                                                              | 63.5                                                                              |                                                                                    | 13.8                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 6.0                                                                               | 6.0                                                                               |                                                                                   | 7.0                                                                               | 6.0                                                                               | 6.0                                                                               |                                                                                    | 7.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 56.0                                                                              | 149.0                                                                             |                                                                                   | 28.0                                                                              | 13.0                                                                              | 192.0                                                                             |                                                                                    | 31.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 15.1                                                                              | 32.1                                                                              |                                                                                   | 3.4                                                                               | 6.8                                                                               | 30.4                                                                              |                                                                                    | 6.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 1.3                                                                               | 16.0                                                                              |                                                                                   | 0.1                                                                               | 0.1                                                                               | 16.4                                                                              |                                                                                    | 0.6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          | 23.7                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 8: Honoapiilani Highway & Leialii Parkway

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|--|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |  |  |  |  |
| Lane Configurations          |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |                                                                                     |  |  |  |  |
| Traffic Volume (veh/h)       | 5                                                                                 | 5                                                                                 | 5                                                                                 | 60                                                                                | 0                                                                                 | 45                                                                                | 5                                                                                   | 1745                                                                                | 90                                                                                  | 30                                                                                  | 1385                                                                                | 5                                                                                   |  |  |  |  |
| Future Volume (veh/h)        | 5                                                                                 | 5                                                                                 | 5                                                                                 | 60                                                                                | 0                                                                                 | 45                                                                                | 5                                                                                   | 1745                                                                                | 90                                                                                  | 30                                                                                  | 1385                                                                                | 5                                                                                   |  |  |  |  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |  |  |  |  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |  |  |  |  |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                              |                                                                                   | 0.97                                                                              | 0.98                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |  |  |  |  |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |  |  |  |  |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |  |  |  |  |
| Adj Flow Rate, veh/h         | 5                                                                                 | 5                                                                                 | 1                                                                                 | 65                                                                                | 0                                                                                 | 1                                                                                 | 5                                                                                   | 1897                                                                                | 96                                                                                  | 33                                                                                  | 1505                                                                                | 5                                                                                   |  |  |  |  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 0                                                                                   |  |  |  |  |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |  |  |  |  |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |  |  |  |  |
| Cap, veh/h                   | 90                                                                                | 80                                                                                | 13                                                                                | 176                                                                               | 0                                                                                 | 138                                                                               | 11                                                                                  | 2706                                                                                | 136                                                                                 | 63                                                                                  | 2961                                                                                | 10                                                                                  |  |  |  |  |
| Arrive On Green              | 0.09                                                                              | 0.09                                                                              | 0.08                                                                              | 0.09                                                                              | 0.00                                                                              | 0.08                                                                              | 0.01                                                                                | 0.79                                                                                | 0.78                                                                                | 0.04                                                                                | 0.82                                                                                | 0.81                                                                                |  |  |  |  |
| Sat Flow, veh/h              | 584                                                                               | 895                                                                               | 148                                                                               | 1372                                                                              | 0                                                                                 | 1543                                                                              | 1774                                                                                | 3429                                                                                | 172                                                                                 | 1774                                                                                | 3618                                                                                | 12                                                                                  |  |  |  |  |
| Grp Volume(v), veh/h         | 11                                                                                | 0                                                                                 | 0                                                                                 | 65                                                                                | 0                                                                                 | 1                                                                                 | 5                                                                                   | 971                                                                                 | 1022                                                                                | 33                                                                                  | 736                                                                                 | 774                                                                                 |  |  |  |  |
| Grp Sat Flow(s),veh/h/ln     | 1627                                                                              | 0                                                                                 | 0                                                                                 | 1372                                                                              | 0                                                                                 | 1543                                                                              | 1774                                                                                | 1770                                                                                | 1832                                                                                | 1774                                                                                | 1770                                                                                | 1861                                                                                |  |  |  |  |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 5.4                                                                               | 0.0                                                                               | 0.1                                                                               | 0.4                                                                                 | 35.9                                                                                | 37.3                                                                                | 2.6                                                                                 | 18.1                                                                                | 18.1                                                                                |  |  |  |  |
| Cycle Q Clear(g_c), s        | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 6.1                                                                               | 0.0                                                                               | 0.1                                                                               | 0.4                                                                                 | 35.9                                                                                | 37.3                                                                                | 2.6                                                                                 | 18.1                                                                                | 18.1                                                                                |  |  |  |  |
| Prop In Lane                 | 0.45                                                                              |                                                                                   | 0.09                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 0.09                                                                                | 1.00                                                                                |                                                                                     | 0.01                                                                                |  |  |  |  |
| Lane Grp Cap(c), veh/h       | 183                                                                               | 0                                                                                 | 0                                                                                 | 176                                                                               | 0                                                                                 | 138                                                                               | 11                                                                                  | 1396                                                                                | 1446                                                                                | 63                                                                                  | 1448                                                                                | 1523                                                                                |  |  |  |  |
| V/C Ratio(X)                 | 0.06                                                                              | 0.00                                                                              | 0.00                                                                              | 0.37                                                                              | 0.00                                                                              | 0.01                                                                              | 0.45                                                                                | 0.70                                                                                | 0.71                                                                                | 0.52                                                                                | 0.51                                                                                | 0.51                                                                                |  |  |  |  |
| Avail Cap(c_a), veh/h        | 312                                                                               | 0                                                                                 | 0                                                                                 | 289                                                                               | 0                                                                                 | 265                                                                               | 101                                                                                 | 1396                                                                                | 1446                                                                                | 101                                                                                 | 1448                                                                                | 1523                                                                                |  |  |  |  |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |  |  |  |  |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.64                                                                                | 0.64                                                                                | 0.64                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |  |  |  |  |
| Uniform Delay (d), s/veh     | 58.4                                                                              | 0.0                                                                               | 0.0                                                                               | 60.7                                                                              | 0.0                                                                               | 58.5                                                                              | 69.3                                                                                | 6.9                                                                                 | 7.1                                                                                 | 66.3                                                                                | 3.9                                                                                 | 4.0                                                                                 |  |  |  |  |
| Incr Delay (d2), s/veh       | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 1.3                                                                               | 0.0                                                                               | 0.0                                                                               | 6.5                                                                                 | 1.9                                                                                 | 1.9                                                                                 | 2.5                                                                                 | 1.3                                                                                 | 1.2                                                                                 |  |  |  |  |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |  |  |  |  |
| %ile BackOfQ(50%),veh/ln     | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 2.5                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                                 | 18.0                                                                                | 19.2                                                                                | 1.3                                                                                 | 9.1                                                                                 | 9.5                                                                                 |  |  |  |  |
| LnGrp Delay(d),s/veh         | 58.6                                                                              | 0.0                                                                               | 0.0                                                                               | 62.0                                                                              | 0.0                                                                               | 58.6                                                                              | 75.8                                                                                | 8.8                                                                                 | 9.0                                                                                 | 68.8                                                                                | 5.2                                                                                 | 5.2                                                                                 |  |  |  |  |
| LnGrp LOS                    | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | A                                                                                   | A                                                                                   |  |  |  |  |
| Approach Vol, veh/h          | 11                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 66                                                                                |                                                                                     | 1998                                                                                |                                                                                     | 1543                                                                                |                                                                                     |                                                                                     |  |  |  |  |
| Approach Delay, s/veh        | 58.6                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 62.0                                                                              |                                                                                     | 9.0                                                                                 |                                                                                     | 6.6                                                                                 |                                                                                     |                                                                                     |  |  |  |  |
| Approach LOS                 | E                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   | E                                                                                 |                                                                                     | A                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     |  |  |  |  |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |
| Phs Duration (G+Y+Rc), s     | 4.9                                                                               | 118.6                                                                             |                                                                                   |                                                                                   | 16.5                                                                              | 9.0                                                                               | 114.5                                                                               | 16.5                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                                 | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |
| Max Green Setting (Gmax), s  | 8.0                                                                               | 95.0                                                                              |                                                                                   |                                                                                   | 23.0                                                                              | 8.0                                                                               | 95.0                                                                                | 23.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |
| Max Q Clear Time (g_c+I1), s | 2.4                                                                               | 20.1                                                                              |                                                                                   |                                                                                   | 8.1                                                                               | 4.6                                                                               | 39.3                                                                                | 2.8                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |
| Green Ext Time (p_c), s      | 0.0                                                                               | 29.0                                                                              |                                                                                   |                                                                                   | 0.1                                                                               | 0.0                                                                               | 41.2                                                                                | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   |                                                                                   | 9.1                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |
| HCM 2010 LOS                 |                                                                                   |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |

# HCM 2010 Signalized Intersection Summary

## 9: Honoapiilani Highway & Front Street/Flemming Road

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |                                                                                   |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 90                                                                                | 5                                                                                 | 5                                                                                 | 105                                                                               | 15                                                                                | 15                                                                                | 5                                                                                   | 1725                                                                                | 20                                                                                  | 10                                                                                  | 1230                                                                                | 185                                                                                 |
| Future Volume (veh/h)        | 90                                                                                | 5                                                                                 | 5                                                                                 | 105                                                                               | 15                                                                                | 15                                                                                | 5                                                                                   | 1725                                                                                | 20                                                                                  | 10                                                                                  | 1230                                                                                | 185                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 98                                                                                | 5                                                                                 | 3                                                                                 | 114                                                                               | 16                                                                                | 12                                                                                | 5                                                                                   | 1875                                                                                | 21                                                                                  | 11                                                                                  | 1337                                                                                | 141                                                                                 |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 0                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 210                                                                               | 8                                                                                 | 5                                                                                 | 198                                                                               | 20                                                                                | 15                                                                                | 7                                                                                   | 2805                                                                                | 31                                                                                  | 14                                                                                  | 2782                                                                                | 1243                                                                                |
| Arrive On Green              | 0.11                                                                              | 0.11                                                                              | 0.10                                                                              | 0.11                                                                              | 0.11                                                                              | 0.10                                                                              | 0.00                                                                                | 0.78                                                                                | 0.77                                                                                | 0.01                                                                                | 0.79                                                                                | 0.79                                                                                |
| Sat Flow, veh/h              | 1387                                                                              | 71                                                                                | 42                                                                                | 1312                                                                              | 184                                                                               | 138                                                                               | 1774                                                                                | 3585                                                                                | 40                                                                                  | 1774                                                                                | 3539                                                                                | 1581                                                                                |
| Grp Volume(v), veh/h         | 106                                                                               | 0                                                                                 | 0                                                                                 | 142                                                                               | 0                                                                                 | 0                                                                                 | 5                                                                                   | 924                                                                                 | 972                                                                                 | 11                                                                                  | 1337                                                                                | 141                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1500                                                                              | 0                                                                                 | 0                                                                                 | 1634                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1856                                                                                | 1774                                                                                | 1770                                                                                | 1581                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 1.8                                                                               | 0.0                                                                               | 0.0                                                                               | 0.3                                                                                 | 28.5                                                                                | 28.8                                                                                | 0.7                                                                                 | 15.6                                                                                | 2.5                                                                                 |
| Cycle Q Clear(g_c), s        | 7.9                                                                               | 0.0                                                                               | 0.0                                                                               | 9.8                                                                               | 0.0                                                                               | 0.0                                                                               | 0.3                                                                                 | 28.5                                                                                | 28.8                                                                                | 0.7                                                                                 | 15.6                                                                                | 2.5                                                                                 |
| Prop In Lane                 | 0.92                                                                              |                                                                                   | 0.03                                                                              | 0.80                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                                |                                                                                     | 0.02                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 223                                                                               | 0                                                                                 | 0                                                                                 | 234                                                                               | 0                                                                                 | 0                                                                                 | 7                                                                                   | 1384                                                                                | 1452                                                                                | 14                                                                                  | 2782                                                                                | 1243                                                                                |
| V/C Ratio(X)                 | 0.48                                                                              | 0.00                                                                              | 0.00                                                                              | 0.61                                                                              | 0.00                                                                              | 0.00                                                                              | 0.73                                                                                | 0.67                                                                                | 0.67                                                                                | 0.81                                                                                | 0.48                                                                                | 0.11                                                                                |
| Avail Cap(c_a), veh/h        | 430                                                                               | 0                                                                                 | 0                                                                                 | 450                                                                               | 0                                                                                 | 0                                                                                 | 118                                                                                 | 1384                                                                                | 1452                                                                                | 118                                                                                 | 2782                                                                                | 1243                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.64                                                                                | 0.64                                                                                | 0.64                                                                                | 0.86                                                                                | 0.86                                                                                | 0.86                                                                                |
| Uniform Delay (d), s/veh     | 51.1                                                                              | 0.0                                                                               | 0.0                                                                               | 51.8                                                                              | 0.0                                                                               | 0.0                                                                               | 59.7                                                                                | 5.9                                                                                 | 6.0                                                                                 | 59.5                                                                                | 4.4                                                                                 | 3.0                                                                                 |
| Incr Delay (d2), s/veh       | 1.6                                                                               | 0.0                                                                               | 0.0                                                                               | 2.5                                                                               | 0.0                                                                               | 0.0                                                                               | 30.1                                                                                | 1.7                                                                                 | 1.6                                                                                 | 28.7                                                                                | 0.5                                                                                 | 0.2                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 3.5                                                                               | 0.0                                                                               | 0.0                                                                               | 4.7                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                                 | 14.2                                                                                | 15.0                                                                                | 0.5                                                                                 | 7.6                                                                                 | 1.2                                                                                 |
| LnGrp Delay(d),s/veh         | 52.6                                                                              | 0.0                                                                               | 0.0                                                                               | 54.3                                                                              | 0.0                                                                               | 0.0                                                                               | 89.8                                                                                | 7.6                                                                                 | 7.6                                                                                 | 88.2                                                                                | 4.9                                                                                 | 3.2                                                                                 |
| LnGrp LOS                    | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | F                                                                                   | A                                                                                   | A                                                                                   | F                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 106                                                                               |                                                                                   |                                                                                   | 142                                                                               |                                                                                   |                                                                                     | 1901                                                                                |                                                                                     |                                                                                     | 1489                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 52.6                                                                              |                                                                                   |                                                                                   | 54.3                                                                              |                                                                                   |                                                                                     | 7.8                                                                                 |                                                                                     |                                                                                     | 5.4                                                                                 |                                                                                     |
| Approach LOS                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 4.5                                                                               | 98.3                                                                              |                                                                                   | 17.2                                                                              | 4.9                                                                               | 97.9                                                                              |                                                                                     | 17.2                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 8.0                                                                               | 68.0                                                                              |                                                                                   | 30.0                                                                              | 8.0                                                                               | 68.0                                                                              |                                                                                     | 30.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.3                                                                               | 17.6                                                                              |                                                                                   | 11.8                                                                              | 2.7                                                                               | 30.8                                                                              |                                                                                     | 9.9                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 31.2                                                                              |                                                                                   | 0.5                                                                               | 0.0                                                                               | 32.5                                                                              |                                                                                     | 0.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 9.9                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 10: Honoapiilani Highway & Kapunakea Street

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |                                                                                     |  |  |                                                                                     |
| Traffic Volume (veh/h)       | 145                                                                               | 30                                                                                | 20                                                                                | 145                                                                               | 25                                                                                | 35                                                                                | 25                                                                                  | 1550                                                                                | 75                                                                                  | 10                                                                                  | 1270                                                                                | 70                                                                                  |
| Future Volume (veh/h)        | 145                                                                               | 30                                                                                | 20                                                                                | 145                                                                               | 25                                                                                | 35                                                                                | 25                                                                                  | 1550                                                                                | 75                                                                                  | 10                                                                                  | 1270                                                                                | 70                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.98                                                                              | 0.99                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 158                                                                               | 33                                                                                | 2                                                                                 | 158                                                                               | 27                                                                                | 5                                                                                 | 27                                                                                  | 1685                                                                                | 80                                                                                  | 11                                                                                  | 1380                                                                                | 73                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 229                                                                               | 38                                                                                | 265                                                                               | 307                                                                               | 259                                                                               | 48                                                                                | 34                                                                                  | 2536                                                                                | 120                                                                                 | 13                                                                                  | 2480                                                                                | 131                                                                                 |
| Arrive On Green              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.16                                                                              | 0.04                                                                                | 1.00                                                                                | 1.00                                                                                | 0.01                                                                                | 0.73                                                                                | 0.72                                                                                |
| Sat Flow, veh/h              | 1070                                                                              | 224                                                                               | 1558                                                                              | 1358                                                                              | 1525                                                                              | 282                                                                               | 1774                                                                                | 3441                                                                                | 163                                                                                 | 1774                                                                                | 3420                                                                                | 181                                                                                 |
| Grp Volume(v), veh/h         | 191                                                                               | 0                                                                                 | 2                                                                                 | 158                                                                               | 0                                                                                 | 32                                                                                | 27                                                                                  | 862                                                                                 | 903                                                                                 | 11                                                                                  | 713                                                                                 | 740                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1294                                                                              | 0                                                                                 | 1558                                                                              | 1358                                                                              | 0                                                                                 | 1807                                                                              | 1774                                                                                | 1770                                                                                | 1834                                                                                | 1774                                                                                | 1770                                                                                | 1831                                                                                |
| Q Serve(g_s), s              | 18.4                                                                              | 0.0                                                                               | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 2.1                                                                               | 2.1                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.9                                                                                 | 25.9                                                                                | 26.2                                                                                |
| Cycle Q Clear(g_c), s        | 20.5                                                                              | 0.0                                                                               | 0.1                                                                               | 13.4                                                                              | 0.0                                                                               | 2.1                                                                               | 2.1                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.9                                                                                 | 25.9                                                                                | 26.2                                                                                |
| Prop In Lane                 | 0.83                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.16                                                                              | 1.00                                                                                |                                                                                     | 0.09                                                                                | 1.00                                                                                |                                                                                     | 0.10                                                                                |
| Lane Grp Cap(c), veh/h       | 267                                                                               | 0                                                                                 | 265                                                                               | 307                                                                               | 0                                                                                 | 307                                                                               | 34                                                                                  | 1304                                                                                | 1352                                                                                | 13                                                                                  | 1283                                                                                | 1328                                                                                |
| V/C Ratio(X)                 | 0.72                                                                              | 0.00                                                                              | 0.01                                                                              | 0.51                                                                              | 0.00                                                                              | 0.10                                                                              | 0.79                                                                                | 0.66                                                                                | 0.67                                                                                | 0.83                                                                                | 0.56                                                                                | 0.56                                                                                |
| Avail Cap(c_a), veh/h        | 310                                                                               | 0                                                                                 | 312                                                                               | 348                                                                               | 0                                                                                 | 361                                                                               | 139                                                                                 | 1304                                                                                | 1352                                                                                | 139                                                                                 | 1283                                                                                | 1328                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.50                                                                                | 0.50                                                                                | 0.50                                                                                | 0.86                                                                                | 0.86                                                                                | 0.86                                                                                |
| Uniform Delay (d), s/veh     | 57.8                                                                              | 0.0                                                                               | 48.3                                                                              | 53.8                                                                              | 0.0                                                                               | 49.2                                                                              | 67.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 69.4                                                                                | 8.8                                                                                 | 8.9                                                                                 |
| Incr Delay (d2), s/veh       | 6.5                                                                               | 0.0                                                                               | 0.0                                                                               | 1.3                                                                               | 0.0                                                                               | 0.1                                                                               | 7.6                                                                                 | 1.3                                                                                 | 1.3                                                                                 | 32.4                                                                                | 1.5                                                                                 | 1.5                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 7.7                                                                               | 0.0                                                                               | 0.1                                                                               | 5.8                                                                               | 0.0                                                                               | 1.1                                                                               | 1.1                                                                                 | 0.5                                                                                 | 0.5                                                                                 | 0.5                                                                                 | 13.0                                                                                | 13.7                                                                                |
| LnGrp Delay(d),s/veh         | 64.2                                                                              | 0.0                                                                               | 48.3                                                                              | 55.1                                                                              | 0.0                                                                               | 49.3                                                                              | 74.7                                                                                | 1.3                                                                                 | 1.3                                                                                 | 101.8                                                                               | 10.3                                                                                | 10.4                                                                                |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | E                                                                                 |                                                                                   | D                                                                                 | E                                                                                   | A                                                                                   | A                                                                                   | F                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          | 193                                                                               |                                                                                   | 190                                                                               |                                                                                   |                                                                                   |                                                                                   | 1792                                                                                |                                                                                     |                                                                                     |                                                                                     | 1464                                                                                |                                                                                     |
| Approach Delay, s/veh        | 64.1                                                                              |                                                                                   | 54.2                                                                              |                                                                                   |                                                                                   |                                                                                   | 2.4                                                                                 |                                                                                     |                                                                                     |                                                                                     | 11.0                                                                                |                                                                                     |
| Approach LOS                 | E                                                                                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   | A                                                                                   |                                                                                     |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 4                                                                                 |                                                                                   | 5                                                                                 | 6                                                                                 | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 6.7                                                                               | 105.5                                                                             | 27.8                                                                              |                                                                                   | 5.0                                                                               | 107.2                                                                             | 27.8                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   | 4.0                                                                               | 5.0                                                                               | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 11.0                                                                              | 88.0                                                                              | 27.0                                                                              |                                                                                   | 11.0                                                                              | 88.0                                                                              | 27.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 4.1                                                                               | 28.2                                                                              | 15.4                                                                              |                                                                                   | 2.9                                                                               | 2.0                                                                               | 22.5                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 25.1                                                                              | 0.5                                                                               |                                                                                   | 0.0                                                                               | 43.0                                                                              | 0.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 11.9                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 11: Honoapiilani Highway & Keawe Street

08/09/2017

|                              |  |      |      |      |      |      |      |      |      |      |      |      |
|------------------------------|------------------------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Movement                     | EBL                                                                                | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations          |                                                                                    | ↩    | ↩    | ↩    | ↩    | ↩    | ↩    | ↩↩   | ↩    | ↩↩   | ↩↩   | ↩    |
| Traffic Volume (veh/h)       | 15                                                                                 | 110  | 35   | 95   | 75   | 715  | 25   | 865  | 120  | 515  | 860  | 20   |
| Future Volume (veh/h)        | 15                                                                                 | 110  | 35   | 95   | 75   | 715  | 25   | 865  | 120  | 515  | 860  | 20   |
| Number                       | 7                                                                                  | 4    | 14   | 3    | 8    | 18   | 1    | 6    | 16   | 5    | 2    | 12   |
| Initial Q (Qb), veh          | 0                                                                                  | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                               |      | 0.99 | 0.99 |      | 0.99 | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Parking Bus, Adj             | 1.00                                                                               | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln       | 1900                                                                               | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h         | 16                                                                                 | 120  | 5    | 103  | 82   | 439  | 27   | 940  | 53   | 560  | 935  | 21   |
| Adj No. of Lanes             | 0                                                                                  | 1    | 1    | 1    | 1    | 1    | 1    | 2    | 1    | 2    | 2    | 0    |
| Peak Hour Factor             | 0.92                                                                               | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, %         | 2                                                                                  | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |
| Cap, veh/h                   | 52                                                                                 | 341  | 328  | 353  | 567  | 478  | 34   | 1527 | 680  | 614  | 2090 | 47   |
| Arrive On Green              | 0.21                                                                               | 0.21 | 0.21 | 0.07 | 0.30 | 0.30 | 0.02 | 0.43 | 0.43 | 0.36 | 1.00 | 1.00 |
| Sat Flow, veh/h              | 110                                                                                | 1627 | 1563 | 1774 | 1863 | 1569 | 1774 | 3539 | 1576 | 3442 | 3539 | 79   |
| Grp Volume(v), veh/h         | 136                                                                                | 0    | 5    | 103  | 82   | 439  | 27   | 940  | 53   | 560  | 468  | 488  |
| Grp Sat Flow(s),veh/h/ln     | 1737                                                                               | 0    | 1563 | 1774 | 1863 | 1569 | 1774 | 1770 | 1576 | 1721 | 1770 | 1849 |
| Q Serve(g_s), s              | 0.0                                                                                | 0.0  | 0.4  | 6.1  | 4.5  | 37.8 | 2.1  | 28.8 | 2.8  | 21.7 | 0.0  | 0.0  |
| Cycle Q Clear(g_c), s        | 8.7                                                                                | 0.0  | 0.4  | 6.1  | 4.5  | 37.8 | 2.1  | 28.8 | 2.8  | 21.7 | 0.0  | 0.0  |
| Prop In Lane                 | 0.12                                                                               |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 0.04 |
| Lane Grp Cap(c), veh/h       | 393                                                                                | 0    | 328  | 353  | 567  | 478  | 34   | 1527 | 680  | 614  | 1045 | 1092 |
| V/C Ratio(X)                 | 0.35                                                                               | 0.00 | 0.02 | 0.29 | 0.14 | 0.92 | 0.79 | 0.62 | 0.08 | 0.91 | 0.45 | 0.45 |
| Avail Cap(c_a), veh/h        | 393                                                                                | 0    | 328  | 528  | 665  | 560  | 177  | 1527 | 680  | 836  | 1045 | 1092 |
| HCM Platoon Ratio            | 1.00                                                                               | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 |
| Upstream Filter(I)           | 1.00                                                                               | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.79 | 0.79 | 0.79 | 0.74 | 0.74 | 0.74 |
| Uniform Delay (d), s/veh     | 47.1                                                                               | 0.0  | 43.8 | 37.9 | 35.4 | 47.0 | 68.4 | 30.8 | 23.4 | 44.0 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh       | 0.5                                                                                | 0.0  | 0.0  | 0.5  | 0.1  | 18.7 | 11.4 | 1.5  | 0.2  | 7.4  | 1.0  | 1.0  |
| Initial Q Delay(d3),s/veh    | 0.0                                                                                | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln     | 4.6                                                                                | 0.0  | 0.2  | 3.0  | 2.3  | 18.9 | 1.2  | 14.4 | 1.2  | 10.9 | 0.3  | 0.3  |
| LnGrp Delay(d),s/veh         | 47.7                                                                               | 0.0  | 43.9 | 38.3 | 35.5 | 65.7 | 79.8 | 32.3 | 23.6 | 51.4 | 1.0  | 1.0  |
| LnGrp LOS                    | D                                                                                  |      | D    | D    | D    | E    | E    | C    | C    | D    | A    | A    |
| Approach Vol, veh/h          |                                                                                    | 141  |      |      | 624  |      |      | 1020 |      |      | 1516 |      |
| Approach Delay, s/veh        |                                                                                    | 47.5 |      |      | 57.2 |      |      | 33.1 |      |      | 19.6 |      |
| Approach LOS                 |                                                                                    | D    |      |      | E    |      |      | C    |      |      | B    |      |
| Timer                        | 1                                                                                  | 2    | 3    | 4    | 5    | 6    | 7    | 8    |      |      |      |      |
| Assigned Phs                 | 1                                                                                  | 2    | 3    | 4    | 5    | 6    |      | 8    |      |      |      |      |
| Phs Duration (G+Y+Rc), s     | 6.7                                                                                | 86.7 | 13.2 | 33.4 | 29.0 | 64.4 |      | 46.6 |      |      |      |      |
| Change Period (Y+Rc), s      | 4.0                                                                                | 5.0  | 5.0  | 5.0  | 4.0  | 5.0  |      | 5.0  |      |      |      |      |
| Max Green Setting (Gmax), s  | 14.0                                                                               | 63.0 | 22.0 | 22.0 | 34.0 | 43.0 |      | 49.0 |      |      |      |      |
| Max Q Clear Time (g_c+I1), s | 4.1                                                                                | 2.0  | 8.1  | 10.7 | 23.7 | 30.8 |      | 39.8 |      |      |      |      |
| Green Ext Time (p_c), s      | 0.0                                                                                | 12.0 | 0.3  | 0.4  | 1.2  | 6.8  |      | 1.8  |      |      |      |      |
| <b>Intersection Summary</b>  |                                                                                    |      |      |      |      |      |      |      |      |      |      |      |
| HCM 2010 Ctrl Delay          |                                                                                    |      | 32.1 |      |      |      |      |      |      |      |      |      |
| HCM 2010 LOS                 |                                                                                    |      | C    |      |      |      |      |      |      |      |      |      |
| <b>Notes</b>                 |                                                                                    |      |      |      |      |      |      |      |      |      |      |      |



---

## **APPENDIX C**

### LEVEL OF SERVICE CALCULATIONS

- Base Year 2022 with Mitigation PM Peak
-

# HCM 2010 Signalized Intersection Summary

## 1: Napilihau Street

08/09/2017

|                              |  |      |      |      |      |      |      |      |      |      |      |      |
|------------------------------|------------------------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Movement                     | EBL                                                                                | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations          |                                                                                    | ↩    | ↩    | ↩    | ↩    |      | ↩    | ↩    | ↩    | ↩    | ↩    | ↩    |
| Traffic Volume (veh/h)       | 55                                                                                 | 25   | 370  | 60   | 25   | 5    | 380  | 215  | 65   | 10   | 280  | 75   |
| Future Volume (veh/h)        | 55                                                                                 | 25   | 370  | 60   | 25   | 5    | 380  | 215  | 65   | 10   | 280  | 75   |
| Number                       | 7                                                                                  | 4    | 14   | 3    | 8    | 18   | 5    | 2    | 12   | 1    | 6    | 16   |
| Initial Q (Qb), veh          | 0                                                                                  | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                               |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Parking Bus, Adj             | 1.00                                                                               | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln       | 1900                                                                               | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h         | 60                                                                                 | 27   | 24   | 65   | 27   | 1    | 413  | 234  | 45   | 11   | 304  | 20   |
| Adj No. of Lanes             | 0                                                                                  | 1    | 1    | 1    | 1    | 0    | 1    | 1    | 1    | 1    | 1    | 1    |
| Peak Hour Factor             | 0.92                                                                               | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, %         | 2                                                                                  | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |
| Cap, veh/h                   | 232                                                                                | 72   | 184  | 236  | 207  | 8    | 501  | 1013 | 861  | 15   | 503  | 428  |
| Arrive On Green              | 0.12                                                                               | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.28 | 0.54 | 0.54 | 0.01 | 0.27 | 0.27 |
| Sat Flow, veh/h              | 912                                                                                | 622  | 1583 | 1348 | 1785 | 66   | 1774 | 1863 | 1583 | 1774 | 1863 | 1583 |
| Grp Volume(v), veh/h         | 87                                                                                 | 0    | 24   | 65   | 0    | 28   | 413  | 234  | 45   | 11   | 304  | 20   |
| Grp Sat Flow(s),veh/h/ln     | 1534                                                                               | 0    | 1583 | 1348 | 0    | 1851 | 1774 | 1863 | 1583 | 1774 | 1863 | 1583 |
| Q Serve(g_s), s              | 1.8                                                                                | 0.0  | 0.7  | 2.3  | 0.0  | 0.7  | 10.5 | 3.2  | 0.6  | 0.3  | 6.9  | 0.5  |
| Cycle Q Clear(g_c), s        | 2.5                                                                                | 0.0  | 0.7  | 4.8  | 0.0  | 0.7  | 10.5 | 3.2  | 0.6  | 0.3  | 6.9  | 0.5  |
| Prop In Lane                 | 0.69                                                                               |      | 1.00 | 1.00 |      | 0.04 | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Lane Grp Cap(c), veh/h       | 304                                                                                | 0    | 184  | 236  | 0    | 215  | 501  | 1013 | 861  | 15   | 503  | 428  |
| V/C Ratio(X)                 | 0.29                                                                               | 0.00 | 0.13 | 0.28 | 0.00 | 0.13 | 0.82 | 0.23 | 0.05 | 0.73 | 0.60 | 0.05 |
| Avail Cap(c_a), veh/h        | 874                                                                                | 0    | 787  | 749  | 0    | 920  | 1102 | 3046 | 2590 | 551  | 2468 | 2098 |
| HCM Platoon Ratio            | 1.00                                                                               | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I)           | 1.00                                                                               | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh     | 19.9                                                                               | 0.0  | 19.2 | 22.2 | 0.0  | 19.2 | 16.2 | 5.7  | 5.2  | 23.9 | 15.4 | 13.0 |
| Incr Delay (d2), s/veh       | 0.5                                                                                | 0.0  | 0.3  | 0.6  | 0.0  | 0.3  | 3.5  | 0.2  | 0.1  | 49.1 | 2.5  | 0.1  |
| Initial Q Delay(d3),s/veh    | 0.0                                                                                | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln     | 1.1                                                                                | 0.0  | 0.3  | 0.9  | 0.0  | 0.4  | 5.5  | 1.7  | 0.3  | 0.3  | 3.8  | 0.2  |
| LnGrp Delay(d),s/veh         | 20.4                                                                               | 0.0  | 19.5 | 22.8 | 0.0  | 19.4 | 19.7 | 6.0  | 5.2  | 73.0 | 17.9 | 13.1 |
| LnGrp LOS                    | C                                                                                  |      | B    | C    |      | B    | B    | A    | A    | E    | B    | B    |
| Approach Vol, veh/h          |                                                                                    | 111  |      |      | 93   |      |      | 692  |      |      | 335  |      |
| Approach Delay, s/veh        |                                                                                    | 20.2 |      |      | 21.8 |      |      | 14.1 |      |      | 19.4 |      |
| Approach LOS                 |                                                                                    | C    |      |      | C    |      |      | B    |      |      | B    |      |
| Timer                        | 1                                                                                  | 2    | 3    | 4    | 5    | 6    | 7    | 8    |      |      |      |      |
| Assigned Phs                 | 1                                                                                  | 2    |      | 4    | 5    | 6    |      | 8    |      |      |      |      |
| Phs Duration (G+Y+Rc), s     | 5.4                                                                                | 32.3 |      | 10.6 | 18.6 | 19.0 |      | 10.6 |      |      |      |      |
| Change Period (Y+Rc), s      | 5.0                                                                                | 6.0  |      | 5.0  | 5.0  | 6.0  |      | 5.0  |      |      |      |      |
| Max Green Setting (Gmax), s  | 15.0                                                                               | 79.0 |      | 24.0 | 30.0 | 64.0 |      | 24.0 |      |      |      |      |
| Max Q Clear Time (g_c+I1), s | 2.3                                                                                | 5.2  |      | 4.5  | 12.5 | 8.9  |      | 6.8  |      |      |      |      |
| Green Ext Time (p_c), s      | 0.0                                                                                | 3.4  |      | 0.5  | 1.2  | 4.2  |      | 0.2  |      |      |      |      |
| <b>Intersection Summary</b>  |                                                                                    |      |      |      |      |      |      |      |      |      |      |      |
| HCM 2010 Ctrl Delay          |                                                                                    |      | 16.7 |      |      |      |      |      |      |      |      |      |
| HCM 2010 LOS                 |                                                                                    |      | B    |      |      |      |      |      |      |      |      |      |

## HCM 2010 Signalized Intersection Summary 2: Hoohui Road

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|--|--|--|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |  |  |  |  |  |  |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 75                                                                                | 20                                                                                | 150                                                                               | 45                                                                                | 15                                                                                | 10                                                                                | 195                                                                                 | 585                                                                                 | 45                                                                                  | 25                                                                                  | 570                                                                                 | 80                                                                                  |  |  |  |  |  |  |
| Future Volume (veh/h)        | 75                                                                                | 20                                                                                | 150                                                                               | 45                                                                                | 15                                                                                | 10                                                                                | 195                                                                                 | 585                                                                                 | 45                                                                                  | 25                                                                                  | 570                                                                                 | 80                                                                                  |  |  |  |  |  |  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |  |  |  |  |  |  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |  |  |  |  |  |  |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |  |  |  |  |  |  |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |  |  |  |  |  |  |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |  |  |  |  |  |  |
| Adj Flow Rate, veh/h         | 82                                                                                | 22                                                                                | 14                                                                                | 49                                                                                | 16                                                                                | 1                                                                                 | 212                                                                                 | 636                                                                                 | 0                                                                                   | 27                                                                                  | 620                                                                                 | 44                                                                                  |  |  |  |  |  |  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |  |  |  |  |  |  |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |  |  |  |  |  |  |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |  |  |  |  |  |  |
| Cap, veh/h                   | 275                                                                               | 55                                                                                | 207                                                                               | 243                                                                               | 227                                                                               | 14                                                                                | 447                                                                                 | 960                                                                                 | 816                                                                                 | 392                                                                                 | 802                                                                                 | 679                                                                                 |  |  |  |  |  |  |
| Arrive On Green              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.10                                                                                | 0.52                                                                                | 0.00                                                                                | 0.02                                                                                | 0.43                                                                                | 0.43                                                                                |  |  |  |  |  |  |
| Sat Flow, veh/h              | 1075                                                                              | 422                                                                               | 1583                                                                              | 1367                                                                              | 1735                                                                              | 108                                                                               | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1576                                                                                |  |  |  |  |  |  |
| Grp Volume(v), veh/h         | 104                                                                               | 0                                                                                 | 14                                                                                | 49                                                                                | 0                                                                                 | 17                                                                                | 212                                                                                 | 636                                                                                 | 0                                                                                   | 27                                                                                  | 620                                                                                 | 44                                                                                  |  |  |  |  |  |  |
| Grp Sat Flow(s),veh/h/ln     | 1497                                                                              | 0                                                                                 | 1583                                                                              | 1367                                                                              | 0                                                                                 | 1844                                                                              | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1576                                                                                |  |  |  |  |  |  |
| Q Serve(g_s), s              | 2.6                                                                               | 0.0                                                                               | 0.4                                                                               | 1.7                                                                               | 0.0                                                                               | 0.4                                                                               | 2.9                                                                                 | 12.0                                                                                | 0.0                                                                                 | 0.4                                                                                 | 13.6                                                                                | 0.8                                                                                 |  |  |  |  |  |  |
| Cycle Q Clear(g_c), s        | 3.0                                                                               | 0.0                                                                               | 0.4                                                                               | 4.7                                                                               | 0.0                                                                               | 0.4                                                                               | 2.9                                                                                 | 12.0                                                                                | 0.0                                                                                 | 0.4                                                                                 | 13.6                                                                                | 0.8                                                                                 |  |  |  |  |  |  |
| Prop In Lane                 | 0.79                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |  |  |  |  |  |  |
| Lane Grp Cap(c), veh/h       | 330                                                                               | 0                                                                                 | 207                                                                               | 243                                                                               | 0                                                                                 | 241                                                                               | 447                                                                                 | 960                                                                                 | 816                                                                                 | 392                                                                                 | 802                                                                                 | 679                                                                                 |  |  |  |  |  |  |
| V/C Ratio(X)                 | 0.31                                                                              | 0.00                                                                              | 0.07                                                                              | 0.20                                                                              | 0.00                                                                              | 0.07                                                                              | 0.47                                                                                | 0.66                                                                                | 0.00                                                                                | 0.07                                                                                | 0.77                                                                                | 0.06                                                                                |  |  |  |  |  |  |
| Avail Cap(c_a), veh/h        | 907                                                                               | 0                                                                                 | 828                                                                               | 779                                                                               | 0                                                                                 | 964                                                                               | 820                                                                                 | 1988                                                                                | 1689                                                                                | 916                                                                                 | 1988                                                                                | 1682                                                                                |  |  |  |  |  |  |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |  |  |  |  |  |  |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 0.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |  |  |  |  |  |  |
| Uniform Delay (d), s/veh     | 19.3                                                                              | 0.0                                                                               | 18.2                                                                              | 21.6                                                                              | 0.0                                                                               | 18.2                                                                              | 8.4                                                                                 | 8.5                                                                                 | 0.0                                                                                 | 8.0                                                                                 | 11.6                                                                                | 8.0                                                                                 |  |  |  |  |  |  |
| Incr Delay (d2), s/veh       | 0.5                                                                               | 0.0                                                                               | 0.1                                                                               | 0.4                                                                               | 0.0                                                                               | 0.1                                                                               | 0.8                                                                                 | 0.8                                                                                 | 0.0                                                                                 | 0.1                                                                                 | 1.6                                                                                 | 0.0                                                                                 |  |  |  |  |  |  |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |  |  |  |  |  |  |
| %ile BackOfQ(50%),veh/ln     | 1.3                                                                               | 0.0                                                                               | 0.2                                                                               | 0.7                                                                               | 0.0                                                                               | 0.2                                                                               | 1.5                                                                                 | 6.2                                                                                 | 0.0                                                                                 | 0.2                                                                                 | 7.3                                                                                 | 0.3                                                                                 |  |  |  |  |  |  |
| LnGrp Delay(d),s/veh         | 19.9                                                                              | 0.0                                                                               | 18.4                                                                              | 22.0                                                                              | 0.0                                                                               | 18.3                                                                              | 9.2                                                                                 | 9.3                                                                                 | 0.0                                                                                 | 8.1                                                                                 | 13.2                                                                                | 8.0                                                                                 |  |  |  |  |  |  |
| LnGrp LOS                    | B                                                                                 |                                                                                   | B                                                                                 | C                                                                                 |                                                                                   | B                                                                                 | A                                                                                   | A                                                                                   |                                                                                     | A                                                                                   | B                                                                                   | A                                                                                   |  |  |  |  |  |  |
| Approach Vol, veh/h          | 118                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 66                                                                                  |                                                                                     | 848                                                                                 |                                                                                     | 691                                                                                 |                                                                                     |  |  |  |  |  |  |
| Approach Delay, s/veh        | 19.7                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 21.0                                                                                |                                                                                     | 9.3                                                                                 |                                                                                     | 12.7                                                                                |                                                                                     |  |  |  |  |  |  |
| Approach LOS                 | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | C                                                                                   |                                                                                     | A                                                                                   |                                                                                     | B                                                                                   |                                                                                     |  |  |  |  |  |  |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |
| Phs Duration (G+Y+Rc), s     | 5.9                                                                               | 30.6                                                                              |                                                                                   |                                                                                   | 11.2                                                                              | 10.0                                                                              | 26.6                                                                                | 11.2                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                                 | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 51.0                                                                              |                                                                                   |                                                                                   | 25.0                                                                              | 15.0                                                                              | 51.0                                                                                | 25.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |
| Max Q Clear Time (g_c+I1), s | 2.4                                                                               | 14.0                                                                              |                                                                                   |                                                                                   | 5.0                                                                               | 4.9                                                                               | 15.6                                                                                | 6.7                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |
| Green Ext Time (p_c), s      | 0.0                                                                               | 4.7                                                                               |                                                                                   |                                                                                   | 0.5                                                                               | 0.4                                                                               | 4.7                                                                                 | 0.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |
| HCM 2010 LOS                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |



# HCM 2010 Signalized Intersection Summary

## 3: Honoapiilani Highway & Akahele Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 60                                                                                | 5                                                                                 | 95                                                                                | 10                                                                                | 5                                                                                 | 10                                                                                | 165                                                                                | 815                                                                                 | 10                                                                                  | 5                                                                                   | 765                                                                                 | 75                                                                                  |
| Future Volume (veh/h)        | 60                                                                                | 5                                                                                 | 95                                                                                | 10                                                                                | 5                                                                                 | 10                                                                                | 165                                                                                | 815                                                                                 | 10                                                                                  | 5                                                                                   | 765                                                                                 | 75                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                  | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 65                                                                                | 5                                                                                 | 4                                                                                 | 11                                                                                | 5                                                                                 | 1                                                                                 | 179                                                                                | 886                                                                                 | 8                                                                                   | 5                                                                                   | 832                                                                                 | 44                                                                                  |
| Adj No. of Lanes             | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 85                                                                                | 114                                                                               | 91                                                                                | 14                                                                                | 150                                                                               | 124                                                                               | 222                                                                                | 1169                                                                                | 994                                                                                 | 7                                                                                   | 944                                                                                 | 801                                                                                 |
| Arrive On Green              | 0.05                                                                              | 0.12                                                                              | 0.12                                                                              | 0.01                                                                              | 0.08                                                                              | 0.08                                                                              | 0.12                                                                               | 0.63                                                                                | 0.63                                                                                | 0.00                                                                                | 0.51                                                                                | 0.51                                                                                |
| Sat Flow, veh/h              | 1774                                                                              | 946                                                                               | 757                                                                               | 1774                                                                              | 1863                                                                              | 1537                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1580                                                                                |
| Grp Volume(v), veh/h         | 65                                                                                | 0                                                                                 | 9                                                                                 | 11                                                                                | 5                                                                                 | 1                                                                                 | 179                                                                                | 886                                                                                 | 8                                                                                   | 5                                                                                   | 832                                                                                 | 44                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1774                                                                              | 0                                                                                 | 1703                                                                              | 1774                                                                              | 1863                                                                              | 1537                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1580                                                                                |
| Q Serve(g_s), s              | 3.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.5                                                                               | 0.2                                                                               | 0.0                                                                               | 8.2                                                                                | 28.2                                                                                | 0.2                                                                                 | 0.2                                                                                 | 33.2                                                                                | 1.2                                                                                 |
| Cycle Q Clear(g_c), s        | 3.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.5                                                                               | 0.2                                                                               | 0.0                                                                               | 8.2                                                                                | 28.2                                                                                | 0.2                                                                                 | 0.2                                                                                 | 33.2                                                                                | 1.2                                                                                 |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 0.44                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 85                                                                                | 0                                                                                 | 205                                                                               | 14                                                                                | 150                                                                               | 124                                                                               | 222                                                                                | 1169                                                                                | 994                                                                                 | 7                                                                                   | 944                                                                                 | 801                                                                                 |
| V/C Ratio(X)                 | 0.77                                                                              | 0.00                                                                              | 0.04                                                                              | 0.77                                                                              | 0.03                                                                              | 0.01                                                                              | 0.81                                                                               | 0.76                                                                                | 0.01                                                                                | 0.72                                                                                | 0.88                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h        | 425                                                                               | 0                                                                                 | 429                                                                               | 425                                                                               | 469                                                                               | 387                                                                               | 532                                                                                | 1452                                                                                | 1234                                                                                | 532                                                                                 | 1452                                                                                | 1231                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 39.3                                                                              | 0.0                                                                               | 32.4                                                                              | 41.3                                                                              | 35.3                                                                              | 35.3                                                                              | 35.5                                                                               | 11.0                                                                                | 5.8                                                                                 | 41.5                                                                                | 18.3                                                                                | 10.4                                                                                |
| Incr Delay (d2), s/veh       | 13.4                                                                              | 0.0                                                                               | 0.1                                                                               | 57.4                                                                              | 0.1                                                                               | 0.0                                                                               | 6.8                                                                                | 1.8                                                                                 | 0.0                                                                                 | 84.6                                                                                | 4.3                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.8                                                                               | 0.0                                                                               | 0.2                                                                               | 0.5                                                                               | 0.1                                                                               | 0.0                                                                               | 4.4                                                                                | 14.9                                                                                | 0.1                                                                                 | 0.3                                                                                 | 18.0                                                                                | 0.5                                                                                 |
| LnGrp Delay(d),s/veh         | 52.6                                                                              | 0.0                                                                               | 32.5                                                                              | 98.7                                                                              | 35.4                                                                              | 35.3                                                                              | 42.4                                                                               | 12.9                                                                                | 5.8                                                                                 | 126.1                                                                               | 22.7                                                                                | 10.5                                                                                |
| LnGrp LOS                    | D                                                                                 |                                                                                   | C                                                                                 | F                                                                                 | D                                                                                 | D                                                                                 | D                                                                                  | B                                                                                   | A                                                                                   | F                                                                                   | C                                                                                   | B                                                                                   |
| Approach Vol, veh/h          | 74                                                                                |                                                                                   |                                                                                   |                                                                                   | 17                                                                                |                                                                                   |                                                                                    |                                                                                     | 1073                                                                                |                                                                                     |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 50.2                                                                              |                                                                                   |                                                                                   |                                                                                   | 76.4                                                                              |                                                                                   |                                                                                    |                                                                                     | 17.7                                                                                |                                                                                     |                                                                                     |                                                                                     |
| Approach LOS                 | D                                                                                 |                                                                                   |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                    |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.3                                                                               | 57.4                                                                              | 5.7                                                                               | 15.0                                                                              | 15.4                                                                              | 47.3                                                                              | 9.0                                                                                | 11.7                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              | 25.0                                                                              | 65.0                                                                              | 20.0                                                                               | 21.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.2                                                                               | 30.2                                                                              | 2.5                                                                               | 2.4                                                                               | 10.2                                                                              | 35.2                                                                              | 5.0                                                                                | 2.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 8.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 7.1                                                                               | 0.1                                                                                | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          | 21.5                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 4: Honoapiilani Highway & Lower Honoapiilani Road

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 75                                                                                | 5                                                                                 | 600                                                                               | 80                                                                                | 10                                                                                | 10                                                                                | 605                                                                                 | 880                                                                                 | 10                                                                                  | 5                                                                                   | 810                                                                                 | 20                                                                                  |
| Future Volume (veh/h)        | 75                                                                                | 5                                                                                 | 600                                                                               | 80                                                                                | 10                                                                                | 10                                                                                | 605                                                                                 | 880                                                                                 | 10                                                                                  | 5                                                                                   | 810                                                                                 | 20                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 82                                                                                | 5                                                                                 | 0                                                                                 | 87                                                                                | 11                                                                                | 9                                                                                 | 658                                                                                 | 957                                                                                 | 11                                                                                  | 5                                                                                   | 880                                                                                 | 6                                                                                   |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 203                                                                               | 8                                                                                 | 139                                                                               | 186                                                                               | 15                                                                                | 12                                                                                | 702                                                                                 | 2681                                                                                | 31                                                                                  | 7                                                                                   | 1260                                                                                | 564                                                                                 |
| Arrive On Green              | 0.10                                                                              | 0.09                                                                              | 0.00                                                                              | 0.10                                                                              | 0.09                                                                              | 0.09                                                                              | 0.40                                                                                | 0.75                                                                                | 0.75                                                                                | 0.00                                                                                | 0.36                                                                                | 0.36                                                                                |
| Sat Flow, veh/h              | 1461                                                                              | 89                                                                                | 1583                                                                              | 1320                                                                              | 167                                                                               | 137                                                                               | 1774                                                                                | 3584                                                                                | 41                                                                                  | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 87                                                                                | 0                                                                                 | 0                                                                                 | 107                                                                               | 0                                                                                 | 0                                                                                 | 658                                                                                 | 473                                                                                 | 495                                                                                 | 5                                                                                   | 880                                                                                 | 6                                                                                   |
| Grp Sat Flow(s),veh/h/ln     | 1550                                                                              | 0                                                                                 | 1583                                                                              | 1623                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1855                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 33.4                                                                                | 8.6                                                                                 | 8.6                                                                                 | 0.3                                                                                 | 20.0                                                                                | 0.2                                                                                 |
| Cycle Q Clear(g_c), s        | 4.7                                                                               | 0.0                                                                               | 0.0                                                                               | 5.5                                                                               | 0.0                                                                               | 0.0                                                                               | 33.4                                                                                | 8.6                                                                                 | 8.6                                                                                 | 0.3                                                                                 | 20.0                                                                                | 0.2                                                                                 |
| Prop In Lane                 | 0.94                                                                              |                                                                                   | 1.00                                                                              | 0.81                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                                |                                                                                     | 0.02                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 228                                                                               | 0                                                                                 | 139                                                                               | 230                                                                               | 0                                                                                 | 0                                                                                 | 702                                                                                 | 1324                                                                                | 1388                                                                                | 7                                                                                   | 1260                                                                                | 564                                                                                 |
| V/C Ratio(X)                 | 0.38                                                                              | 0.00                                                                              | 0.00                                                                              | 0.47                                                                              | 0.00                                                                              | 0.00                                                                              | 0.94                                                                                | 0.36                                                                                | 0.36                                                                                | 0.72                                                                                | 0.70                                                                                | 0.01                                                                                |
| Avail Cap(c_a), veh/h        | 404                                                                               | 0                                                                                 | 338                                                                               | 490                                                                               | 0                                                                                 | 0                                                                                 | 1345                                                                                | 1324                                                                                | 1388                                                                                | 1345                                                                                | 2607                                                                                | 1166                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 40.7                                                                              | 0.0                                                                               | 0.0                                                                               | 41.0                                                                              | 0.0                                                                               | 0.0                                                                               | 27.2                                                                                | 4.1                                                                                 | 4.1                                                                                 | 46.6                                                                                | 25.8                                                                                | 19.5                                                                                |
| Incr Delay (d2), s/veh       | 1.1                                                                               | 0.0                                                                               | 0.0                                                                               | 1.5                                                                               | 0.0                                                                               | 0.0                                                                               | 2.8                                                                                 | 0.3                                                                                 | 0.3                                                                                 | 40.7                                                                                | 1.5                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 2.2                                                                               | 0.0                                                                               | 0.0                                                                               | 2.7                                                                               | 0.0                                                                               | 0.0                                                                               | 16.8                                                                                | 4.2                                                                                 | 4.4                                                                                 | 0.2                                                                                 | 10.0                                                                                | 0.1                                                                                 |
| LnGrp Delay(d),s/veh         | 41.7                                                                              | 0.0                                                                               | 0.0                                                                               | 42.5                                                                              | 0.0                                                                               | 0.0                                                                               | 30.0                                                                                | 4.4                                                                                 | 4.4                                                                                 | 87.3                                                                                | 27.4                                                                                | 19.5                                                                                |
| LnGrp LOS                    | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | C                                                                                   | A                                                                                   | A                                                                                   | F                                                                                   | C                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 87                                                                                |                                                                                   |                                                                                   | 107                                                                               |                                                                                   |                                                                                     | 1626                                                                                |                                                                                     |                                                                                     | 891                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 41.7                                                                              |                                                                                   |                                                                                   | 42.5                                                                              |                                                                                   |                                                                                     | 14.8                                                                                |                                                                                     |                                                                                     | 27.6                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 41.1                                                                              | 39.4                                                                              |                                                                                   | 13.2                                                                              | 4.4                                                                               | 76.1                                                                              |                                                                                     | 13.2                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 71.0                                                                              | 69.0                                                                              |                                                                                   | 25.0                                                                              | 71.0                                                                              | 69.0                                                                              |                                                                                     | 20.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 35.4                                                                              | 22.0                                                                              |                                                                                   | 7.5                                                                               | 2.3                                                                               | 10.6                                                                              |                                                                                     | 6.7                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 1.7                                                                               | 11.4                                                                              |                                                                                   | 0.3                                                                               | 0.0                                                                               | 12.2                                                                              |                                                                                     | 0.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 20.9                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 5: Honoapiilani Highway & Halawai Drive

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 50                                                                                | 5                                                                                 | 140                                                                               | 15                                                                                | 0                                                                                 | 5                                                                                 | 135                                                                                 | 1435                                                                                | 10                                                                                  | 10                                                                                  | 1485                                                                                | 60                                                                                  |
| Future Volume (veh/h)        | 50                                                                                | 5                                                                                 | 140                                                                               | 15                                                                                | 0                                                                                 | 5                                                                                 | 135                                                                                 | 1435                                                                                | 10                                                                                  | 10                                                                                  | 1485                                                                                | 60                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.96                                                                              |                                                                                   | 1.00                                                                              | 0.97                                                                              |                                                                                   | 0.96                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 54                                                                                | 5                                                                                 | -5                                                                                | 16                                                                                | 0                                                                                 | 1                                                                                 | 147                                                                                 | 1560                                                                                | 11                                                                                  | 11                                                                                  | 1614                                                                                | 38                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 214                                                                               | 16                                                                                | 172                                                                               | 227                                                                               | 2                                                                                 | 9                                                                                 | 180                                                                                 | 2626                                                                                | 19                                                                                  | 14                                                                                  | 2248                                                                                | 1006                                                                                |
| Arrive On Green              | 0.12                                                                              | 0.11                                                                              | 0.00                                                                              | 0.12                                                                              | 0.00                                                                              | 0.11                                                                              | 0.10                                                                                | 0.73                                                                                | 0.73                                                                                | 0.01                                                                                | 0.64                                                                                | 0.64                                                                                |
| Sat Flow, veh/h              | 1268                                                                              | 149                                                                               | 1583                                                                              | 1376                                                                              | 20                                                                                | 87                                                                                | 1774                                                                                | 3602                                                                                | 25                                                                                  | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 59                                                                                | 0                                                                                 | -5                                                                                | 17                                                                                | 0                                                                                 | 0                                                                                 | 147                                                                                 | 766                                                                                 | 805                                                                                 | 11                                                                                  | 1614                                                                                | 38                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1418                                                                              | 0                                                                                 | 1583                                                                              | 1483                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1858                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 2.5                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 7.4                                                                                 | 18.8                                                                                | 18.8                                                                                | 0.6                                                                                 | 27.7                                                                                | 0.8                                                                                 |
| Cycle Q Clear(g_c), s        | 3.3                                                                               | 0.0                                                                               | 0.0                                                                               | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 7.4                                                                                 | 18.8                                                                                | 18.8                                                                                | 0.6                                                                                 | 27.7                                                                                | 0.8                                                                                 |
| Prop In Lane                 | 0.92                                                                              |                                                                                   | 1.00                                                                              | 0.94                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                                |                                                                                     | 0.01                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 246                                                                               | 0                                                                                 | 172                                                                               | 255                                                                               | 0                                                                                 | 0                                                                                 | 180                                                                                 | 1290                                                                                | 1354                                                                                | 14                                                                                  | 2248                                                                                | 1006                                                                                |
| V/C Ratio(X)                 | 0.24                                                                              | 0.00                                                                              | -0.03                                                                             | 0.07                                                                              | 0.00                                                                              | 0.00                                                                              | 0.82                                                                                | 0.59                                                                                | 0.59                                                                                | 0.77                                                                                | 0.72                                                                                | 0.04                                                                                |
| Avail Cap(c_a), veh/h        | 447                                                                               | 0                                                                                 | 401                                                                               | 454                                                                               | 0                                                                                 | 0                                                                                 | 411                                                                                 | 1677                                                                                | 1761                                                                                | 215                                                                                 | 2965                                                                                | 1326                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 37.0                                                                              | 0.0                                                                               | 0.0                                                                               | 36.0                                                                              | 0.0                                                                               | 0.0                                                                               | 39.9                                                                                | 5.9                                                                                 | 5.9                                                                                 | 44.9                                                                                | 11.1                                                                                | 6.2                                                                                 |
| Incr Delay (d2), s/veh       | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 3.4                                                                                 | 0.9                                                                                 | 0.9                                                                                 | 27.4                                                                                | 1.0                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.4                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 3.8                                                                                 | 9.3                                                                                 | 9.7                                                                                 | 0.4                                                                                 | 13.8                                                                                | 0.4                                                                                 |
| LnGrp Delay(d),s/veh         | 37.2                                                                              | 0.0                                                                               | 0.0                                                                               | 36.0                                                                              | 0.0                                                                               | 0.0                                                                               | 43.3                                                                                | 6.8                                                                                 | 6.8                                                                                 | 72.3                                                                                | 12.1                                                                                | 6.2                                                                                 |
| LnGrp LOS                    | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 54                                                                                |                                                                                   |                                                                                   | 17                                                                                |                                                                                   |                                                                                     | 1718                                                                                |                                                                                     |                                                                                     | 1663                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 40.6                                                                              |                                                                                   |                                                                                   | 36.0                                                                              |                                                                                   |                                                                                     | 9.9                                                                                 |                                                                                     |                                                                                     | 12.4                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 13.2                                                                              | 62.6                                                                              |                                                                                   | 14.9                                                                              | 4.7                                                                               | 71.1                                                                              |                                                                                     | 14.9                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 21.0                                                                              | 76.0                                                                              |                                                                                   | 23.0                                                                              | 11.0                                                                              | 86.0                                                                              |                                                                                     | 23.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 9.4                                                                               | 29.7                                                                              |                                                                                   | 2.8                                                                               | 2.6                                                                               | 20.8                                                                              |                                                                                     | 5.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.1                                                                               | 27.9                                                                              |                                                                                   | 0.0                                                                               | 0.0                                                                               | 29.9                                                                              |                                                                                     | 0.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          | 11.7                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 6: Honoapiilani Highway & Kai Ala Drive/Puukolii Road

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 75                                                                                | 5                                                                                 | 175                                                                               | 70                                                                                | 5                                                                                 | 45                                                                                | 125                                                                                 | 1425                                                                                | 60                                                                                  | 35                                                                                  | 1645                                                                                | 95                                                                                  |
| Future Volume (veh/h)        | 75                                                                                | 5                                                                                 | 175                                                                               | 70                                                                                | 5                                                                                 | 45                                                                                | 125                                                                                 | 1425                                                                                | 60                                                                                  | 35                                                                                  | 1645                                                                                | 95                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.99                                                                              | 0.99                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 82                                                                                | 5                                                                                 | 27                                                                                | 76                                                                                | 5                                                                                 | 1                                                                                 | 136                                                                                 | 1549                                                                                | 49                                                                                  | 38                                                                                  | 1788                                                                                | 81                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 212                                                                               | 12                                                                                | 205                                                                               | 142                                                                               | 197                                                                               | 39                                                                                | 157                                                                                 | 2656                                                                                | 1187                                                                                | 49                                                                                  | 2440                                                                                | 1091                                                                                |
| Arrive On Green              | 0.14                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.09                                                                                | 0.75                                                                                | 0.75                                                                                | 0.03                                                                                | 0.69                                                                                | 0.69                                                                                |
| Sat Flow, veh/h              | 1298                                                                              | 89                                                                                | 1562                                                                              | 1358                                                                              | 1504                                                                              | 301                                                                               | 1774                                                                                | 3539                                                                                | 1582                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 87                                                                                | 0                                                                                 | 27                                                                                | 76                                                                                | 0                                                                                 | 6                                                                                 | 136                                                                                 | 1549                                                                                | 49                                                                                  | 38                                                                                  | 1788                                                                                | 81                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1387                                                                              | 0                                                                                 | 1562                                                                              | 1358                                                                              | 0                                                                                 | 1805                                                                              | 1774                                                                                | 1770                                                                                | 1582                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 9.2                                                                               | 0.0                                                                               | 2.5                                                                               | 9.1                                                                               | 0.0                                                                               | 0.5                                                                               | 12.5                                                                                | 32.1                                                                                | 1.3                                                                                 | 3.5                                                                                 | 52.3                                                                                | 2.8                                                                                 |
| Cycle Q Clear(g_c), s        | 9.7                                                                               | 0.0                                                                               | 2.5                                                                               | 18.8                                                                              | 0.0                                                                               | 0.5                                                                               | 12.5                                                                                | 32.1                                                                                | 1.3                                                                                 | 3.5                                                                                 | 52.3                                                                                | 2.8                                                                                 |
| Prop In Lane                 | 0.94                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.17                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 233                                                                               | 0                                                                                 | 205                                                                               | 142                                                                               | 0                                                                                 | 237                                                                               | 157                                                                                 | 2656                                                                                | 1187                                                                                | 49                                                                                  | 2440                                                                                | 1091                                                                                |
| V/C Ratio(X)                 | 0.37                                                                              | 0.00                                                                              | 0.13                                                                              | 0.54                                                                              | 0.00                                                                              | 0.03                                                                              | 0.86                                                                                | 0.58                                                                                | 0.04                                                                                | 0.78                                                                                | 0.73                                                                                | 0.07                                                                                |
| Avail Cap(c_a), veh/h        | 253                                                                               | 0                                                                                 | 227                                                                               | 161                                                                               | 0                                                                                 | 263                                                                               | 280                                                                                 | 2656                                                                                | 1187                                                                                | 108                                                                                 | 2440                                                                                | 1091                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.71                                                                                | 0.71                                                                                | 0.71                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 66.2                                                                              | 0.0                                                                               | 63.4                                                                              | 75.2                                                                              | 0.0                                                                               | 62.5                                                                              | 74.2                                                                                | 9.1                                                                                 | 5.3                                                                                 | 79.7                                                                                | 16.1                                                                                | 8.4                                                                                 |
| Incr Delay (d2), s/veh       | 1.0                                                                               | 0.0                                                                               | 0.3                                                                               | 3.1                                                                               | 0.0                                                                               | 0.0                                                                               | 3.9                                                                                 | 0.7                                                                                 | 0.0                                                                                 | 9.3                                                                                 | 2.0                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 3.7                                                                               | 0.0                                                                               | 1.1                                                                               | 3.5                                                                               | 0.0                                                                               | 0.2                                                                               | 6.3                                                                                 | 15.7                                                                                | 0.6                                                                                 | 1.8                                                                                 | 26.0                                                                                | 1.3                                                                                 |
| LnGrp Delay(d),s/veh         | 67.2                                                                              | 0.0                                                                               | 63.7                                                                              | 78.4                                                                              | 0.0                                                                               | 62.5                                                                              | 78.1                                                                                | 9.8                                                                                 | 5.3                                                                                 | 89.0                                                                                | 18.1                                                                                | 8.5                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                   | A                                                                                   | A                                                                                   | F                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 114                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 82                                                                                | 1734                                                                                |                                                                                     |                                                                                     | 1907                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 66.4                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 77.2                                                                              | 15.0                                                                                |                                                                                     |                                                                                     | 19.1                                                                                |                                                                                     |                                                                                     |
| Approach LOS                 | E                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   | E                                                                                 | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 4                                                                                 |                                                                                   | 5                                                                                 | 6                                                                                 | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 18.6                                                                              | 119.7                                                                             | 26.6                                                                              |                                                                                   | 8.6                                                                               | 129.8                                                                             | 26.6                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 6.0                                                                               | 5.0                                                                               |                                                                                   | 4.0                                                                               | 6.0                                                                               | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 26.0                                                                              | 100.0                                                                             | 24.0                                                                              |                                                                                   | 10.0                                                                              | 116.0                                                                             | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 14.5                                                                              | 54.3                                                                              | 20.8                                                                              |                                                                                   | 5.5                                                                               | 34.1                                                                              | 11.7                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.2                                                                               | 32.1                                                                              | 0.1                                                                               |                                                                                   | 0.0                                                                               | 34.5                                                                              | 0.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 19.9                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 7: Honoapiilani Highway & Kaanapali Parkway/Halelo Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |  |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 290                                                                               | 5                                                                                 | 615                                                                               | 15                                                                                | 0                                                                                 | 5                                                                                 | 385                                                                                | 1470                                                                                | 10                                                                                  | 75                                                                                  | 1690                                                                                | 135                                                                                 |
| Future Volume (veh/h)        | 290                                                                               | 5                                                                                 | 615                                                                               | 15                                                                                | 0                                                                                 | 5                                                                                 | 385                                                                                | 1470                                                                                | 10                                                                                  | 75                                                                                  | 1690                                                                                | 135                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 0.96                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 319                                                                               | 0                                                                                 | 460                                                                               | 16                                                                                | 0                                                                                 | 1                                                                                 | 418                                                                                | 1598                                                                                | 11                                                                                  | 82                                                                                  | 1837                                                                                | 126                                                                                 |
| Adj No. of Lanes             | 2                                                                                 | 0                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 2                                                                                  | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 533                                                                               | 0                                                                                 | 906                                                                               | 70                                                                                | 0                                                                                 | 4                                                                                 | 490                                                                                | 2411                                                                                | 17                                                                                  | 114                                                                                 | 2090                                                                                | 1166                                                                                |
| Arrive On Green              | 0.15                                                                              | 0.00                                                                              | 0.15                                                                              | 0.04                                                                              | 0.00                                                                              | 0.03                                                                              | 0.14                                                                               | 0.67                                                                                | 0.66                                                                                | 0.06                                                                                | 0.59                                                                                | 0.59                                                                                |
| Sat Flow, veh/h              | 3548                                                                              | 0                                                                                 | 3123                                                                              | 1653                                                                              | 0                                                                                 | 103                                                                               | 3442                                                                               | 3603                                                                                | 25                                                                                  | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 319                                                                               | 0                                                                                 | 460                                                                               | 17                                                                                | 0                                                                                 | 0                                                                                 | 418                                                                                | 784                                                                                 | 825                                                                                 | 82                                                                                  | 1837                                                                                | 126                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1774                                                                              | 0                                                                                 | 1562                                                                              | 1756                                                                              | 0                                                                                 | 0                                                                                 | 1721                                                                               | 1770                                                                                | 1858                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 18.0                                                                              | 0.0                                                                               | 26.4                                                                              | 2.0                                                                               | 0.0                                                                               | 0.0                                                                               | 25.4                                                                               | 56.5                                                                                | 56.6                                                                                | 9.7                                                                                 | 94.7                                                                                | 4.9                                                                                 |
| Cycle Q Clear(g_c), s        | 18.0                                                                              | 0.0                                                                               | 26.4                                                                              | 2.0                                                                               | 0.0                                                                               | 0.0                                                                               | 25.4                                                                               | 56.5                                                                                | 56.6                                                                                | 9.7                                                                                 | 94.7                                                                                | 4.9                                                                                 |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.94                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                               |                                                                                     | 0.01                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 533                                                                               | 0                                                                                 | 906                                                                               | 74                                                                                | 0                                                                                 | 0                                                                                 | 490                                                                                | 1184                                                                                | 1243                                                                                | 114                                                                                 | 2090                                                                                | 1166                                                                                |
| V/C Ratio(X)                 | 0.60                                                                              | 0.00                                                                              | 0.51                                                                              | 0.23                                                                              | 0.00                                                                              | 0.00                                                                              | 0.85                                                                               | 0.66                                                                                | 0.66                                                                                | 0.72                                                                                | 0.88                                                                                | 0.11                                                                                |
| Avail Cap(c_a), veh/h        | 563                                                                               | 0                                                                                 | 932                                                                               | 254                                                                               | 0                                                                                 | 0                                                                                 | 931                                                                                | 1601                                                                                | 1681                                                                                | 124                                                                                 | 2492                                                                                | 1345                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 85.1                                                                              | 0.0                                                                               | 63.7                                                                              | 99.4                                                                              | 0.0                                                                               | 0.0                                                                               | 89.7                                                                               | 21.1                                                                                | 21.1                                                                                | 98.5                                                                                | 37.4                                                                                | 8.1                                                                                 |
| Incr Delay (d2), s/veh       | 1.0                                                                               | 0.0                                                                               | 0.2                                                                               | 0.6                                                                               | 0.0                                                                               | 0.0                                                                               | 1.7                                                                                | 0.9                                                                                 | 0.9                                                                                 | 13.9                                                                                | 3.7                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 8.9                                                                               | 0.0                                                                               | 11.4                                                                              | 1.0                                                                               | 0.0                                                                               | 0.0                                                                               | 12.2                                                                               | 27.8                                                                                | 29.2                                                                                | 5.2                                                                                 | 47.3                                                                                | 3.3                                                                                 |
| LnGrp Delay(d),s/veh         | 86.1                                                                              | 0.0                                                                               | 63.9                                                                              | 100.0                                                                             | 0.0                                                                               | 0.0                                                                               | 91.4                                                                               | 22.0                                                                                | 22.0                                                                                | 112.3                                                                               | 41.1                                                                                | 8.2                                                                                 |
| LnGrp LOS                    | F                                                                                 |                                                                                   | E                                                                                 | F                                                                                 |                                                                                   |                                                                                   | F                                                                                  | C                                                                                   | C                                                                                   | F                                                                                   | D                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 779                                                                               |                                                                                   |                                                                                   |                                                                                   | 17                                                                                |                                                                                   |                                                                                    | 2027                                                                                |                                                                                     |                                                                                     | 2045                                                                                |                                                                                     |
| Approach Delay, s/veh        | 73.0                                                                              |                                                                                   |                                                                                   |                                                                                   | 100.0                                                                             |                                                                                   |                                                                                    | 36.3                                                                                |                                                                                     |                                                                                     | 41.9                                                                                |                                                                                     |
| Approach LOS                 | E                                                                                 |                                                                                   |                                                                                   |                                                                                   | F                                                                                 |                                                                                   |                                                                                    | D                                                                                   |                                                                                     |                                                                                     | D                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 34.6                                                                              | 130.6                                                                             |                                                                                   | 13.0                                                                              | 17.7                                                                              | 147.5                                                                             |                                                                                    | 36.2                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 6.0                                                                               | 6.0                                                                               |                                                                                   | 7.0                                                                               | 6.0                                                                               | 6.0                                                                               |                                                                                    | 7.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 56.0                                                                              | 149.0                                                                             |                                                                                   | 28.0                                                                              | 13.0                                                                              | 192.0                                                                             |                                                                                    | 31.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 27.4                                                                              | 96.7                                                                              |                                                                                   | 4.0                                                                               | 11.7                                                                              | 58.6                                                                              |                                                                                    | 28.4                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 1.1                                                                               | 27.9                                                                              |                                                                                   | 0.0                                                                               | 0.0                                                                               | 21.5                                                                              |                                                                                    | 0.8                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          | 44.8                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 | D                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 8: Honoapiilani Highway & Leialii Parkway

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |                                                                                     |
| Traffic Volume (veh/h)       | 10                                                                                | 0                                                                                 | 5                                                                                 | 90                                                                                | 5                                                                                 | 60                                                                                | 10                                                                                  | 1805                                                                                | 90                                                                                  | 85                                                                                  | 2250                                                                                | 5                                                                                   |
| Future Volume (veh/h)        | 10                                                                                | 0                                                                                 | 5                                                                                 | 90                                                                                | 5                                                                                 | 60                                                                                | 10                                                                                  | 1805                                                                                | 90                                                                                  | 85                                                                                  | 2250                                                                                | 5                                                                                   |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 11                                                                                | 0                                                                                 | 1                                                                                 | 98                                                                                | 5                                                                                 | 3                                                                                 | 11                                                                                  | 1962                                                                                | 96                                                                                  | 92                                                                                  | 2446                                                                                | 5                                                                                   |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 160                                                                               | 2                                                                                 | 10                                                                                | 182                                                                               | 96                                                                                | 58                                                                                | 18                                                                                  | 2599                                                                                | 126                                                                                 | 118                                                                                 | 2945                                                                                | 6                                                                                   |
| Arrive On Green              | 0.09                                                                              | 0.00                                                                              | 0.08                                                                              | 0.09                                                                              | 0.09                                                                              | 0.08                                                                              | 0.02                                                                                | 1.00                                                                                | 1.00                                                                                | 0.07                                                                                | 0.81                                                                                | 0.81                                                                                |
| Sat Flow, veh/h              | 1235                                                                              | 26                                                                                | 115                                                                               | 1410                                                                              | 1092                                                                              | 655                                                                               | 1774                                                                                | 3436                                                                                | 167                                                                                 | 1774                                                                                | 3624                                                                                | 7                                                                                   |
| Grp Volume(v), veh/h         | 12                                                                                | 0                                                                                 | 0                                                                                 | 98                                                                                | 0                                                                                 | 8                                                                                 | 11                                                                                  | 1003                                                                                | 1055                                                                                | 92                                                                                  | 1194                                                                                | 1257                                                                                |
| Grp Sat Flow(s),veh/h/ln     | 1376                                                                              | 0                                                                                 | 0                                                                                 | 1410                                                                              | 0                                                                                 | 1747                                                                              | 1774                                                                                | 1770                                                                                | 1833                                                                                | 1774                                                                                | 1770                                                                                | 1861                                                                                |
| Q Serve(g_s), s              | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 7.4                                                                               | 0.0                                                                               | 0.6                                                                               | 0.8                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 6.9                                                                                 | 52.4                                                                                | 52.5                                                                                |
| Cycle Q Clear(g_c), s        | 1.4                                                                               | 0.0                                                                               | 0.0                                                                               | 8.8                                                                               | 0.0                                                                               | 0.6                                                                               | 0.8                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 6.9                                                                                 | 52.4                                                                                | 52.5                                                                                |
| Prop In Lane                 | 0.92                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                              |                                                                                   | 0.38                                                                              | 1.00                                                                                |                                                                                     | 0.09                                                                                | 1.00                                                                                |                                                                                     | 0.00                                                                                |
| Lane Grp Cap(c), veh/h       | 173                                                                               | 0                                                                                 | 0                                                                                 | 182                                                                               | 0                                                                                 | 154                                                                               | 18                                                                                  | 1338                                                                                | 1386                                                                                | 118                                                                                 | 1438                                                                                | 1513                                                                                |
| V/C Ratio(X)                 | 0.07                                                                              | 0.00                                                                              | 0.00                                                                              | 0.54                                                                              | 0.00                                                                              | 0.05                                                                              | 0.62                                                                                | 0.75                                                                                | 0.76                                                                                | 0.78                                                                                | 0.83                                                                                | 0.83                                                                                |
| Avail Cap(c_a), veh/h        | 299                                                                               | 0                                                                                 | 0                                                                                 | 308                                                                               | 0                                                                                 | 311                                                                               | 145                                                                                 | 1338                                                                                | 1386                                                                                | 250                                                                                 | 1438                                                                                | 1513                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.60                                                                                | 0.60                                                                                | 0.60                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 56.9                                                                              | 0.0                                                                               | 0.0                                                                               | 60.0                                                                              | 0.0                                                                               | 56.5                                                                              | 65.9                                                                                | 0.0                                                                                 | 0.0                                                                                 | 62.0                                                                                | 7.3                                                                                 | 7.3                                                                                 |
| Incr Delay (d2), s/veh       | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 2.5                                                                               | 0.0                                                                               | 0.1                                                                               | 7.6                                                                                 | 2.4                                                                                 | 2.4                                                                                 | 4.1                                                                                 | 5.7                                                                                 | 5.4                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 3.7                                                                               | 0.0                                                                               | 0.3                                                                               | 0.4                                                                                 | 0.9                                                                                 | 0.9                                                                                 | 3.5                                                                                 | 27.2                                                                                | 28.5                                                                                |
| LnGrp Delay(d),s/veh         | 57.0                                                                              | 0.0                                                                               | 0.0                                                                               | 62.5                                                                              | 0.0                                                                               | 56.7                                                                              | 73.5                                                                                | 2.4                                                                                 | 2.4                                                                                 | 66.2                                                                                | 13.0                                                                                | 12.7                                                                                |
| LnGrp LOS                    | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 12                                                                                |                                                                                   |                                                                                   | 106                                                                               |                                                                                   |                                                                                     | 2069                                                                                |                                                                                     |                                                                                     | 2543                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 57.0                                                                              |                                                                                   |                                                                                   | 62.0                                                                              |                                                                                   |                                                                                     | 2.8                                                                                 |                                                                                     |                                                                                     | 14.8                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.4                                                                               | 113.7                                                                             |                                                                                   | 15.9                                                                              | 13.0                                                                              | 106.1                                                                             |                                                                                     | 15.9                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 11.0                                                                              | 87.0                                                                              |                                                                                   | 23.0                                                                              | 19.0                                                                              | 79.0                                                                              |                                                                                     | 23.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.8                                                                               | 54.5                                                                              |                                                                                   | 10.8                                                                              | 8.9                                                                               | 2.0                                                                               |                                                                                     | 3.4                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 30.8                                                                              |                                                                                   | 0.2                                                                               | 0.1                                                                               | 54.6                                                                              |                                                                                     | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   |                                                                                   | 10.7                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 9: Honoapiilani Highway & Front Street/Flemming Road

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |                                                                                   |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 175                                                                               | 15                                                                                | 10                                                                                | 60                                                                                | 5                                                                                 | 10                                                                                | 5                                                                                   | 1730                                                                                | 20                                                                                  | 5                                                                                   | 1910                                                                                | 325                                                                                 |
| Future Volume (veh/h)        | 175                                                                               | 15                                                                                | 10                                                                                | 60                                                                                | 5                                                                                 | 10                                                                                | 5                                                                                   | 1730                                                                                | 20                                                                                  | 5                                                                                   | 1910                                                                                | 325                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 190                                                                               | 16                                                                                | 9                                                                                 | 65                                                                                | 5                                                                                 | 7                                                                                 | 5                                                                                   | 1880                                                                                | 21                                                                                  | 5                                                                                   | 2076                                                                                | 278                                                                                 |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 0                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 268                                                                               | 18                                                                                | 10                                                                                | 273                                                                               | 22                                                                                | 25                                                                                | 7                                                                                   | 2662                                                                                | 30                                                                                  | 7                                                                                   | 2627                                                                                | 1175                                                                                |
| Arrive On Green              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.01                                                                                | 1.00                                                                                | 1.00                                                                                | 0.00                                                                                | 0.74                                                                                | 0.74                                                                                |
| Sat Flow, veh/h              | 1321                                                                              | 111                                                                               | 63                                                                                | 1358                                                                              | 132                                                                               | 149                                                                               | 1774                                                                                | 3585                                                                                | 40                                                                                  | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 215                                                                               | 0                                                                                 | 0                                                                                 | 77                                                                                | 0                                                                                 | 0                                                                                 | 5                                                                                   | 926                                                                                 | 975                                                                                 | 5                                                                                   | 2076                                                                                | 278                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1495                                                                              | 0                                                                                 | 0                                                                                 | 1639                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1856                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 13.4                                                                              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.4                                                                                 | 49.3                                                                                | 7.4                                                                                 |
| Cycle Q Clear(g_c), s        | 18.8                                                                              | 0.0                                                                               | 0.0                                                                               | 5.4                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.4                                                                                 | 49.3                                                                                | 7.4                                                                                 |
| Prop In Lane                 | 0.88                                                                              |                                                                                   | 0.04                                                                              | 0.84                                                                              |                                                                                   | 0.09                                                                              | 1.00                                                                                |                                                                                     | 0.02                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 297                                                                               | 0                                                                                 | 0                                                                                 | 319                                                                               | 0                                                                                 | 0                                                                                 | 7                                                                                   | 1314                                                                                | 1378                                                                                | 7                                                                                   | 2627                                                                                | 1175                                                                                |
| V/C Ratio(X)                 | 0.72                                                                              | 0.00                                                                              | 0.00                                                                              | 0.24                                                                              | 0.00                                                                              | 0.00                                                                              | 0.74                                                                                | 0.71                                                                                | 0.71                                                                                | 0.74                                                                                | 0.79                                                                                | 0.24                                                                                |
| Avail Cap(c_a), veh/h        | 379                                                                               | 0                                                                                 | 0                                                                                 | 401                                                                               | 0                                                                                 | 0                                                                                 | 105                                                                                 | 1314                                                                                | 1378                                                                                | 105                                                                                 | 2627                                                                                | 1175                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.60                                                                                | 0.60                                                                                | 0.60                                                                                | 0.39                                                                                | 0.39                                                                                | 0.39                                                                                |
| Uniform Delay (d), s/veh     | 54.6                                                                              | 0.0                                                                               | 0.0                                                                               | 49.4                                                                              | 0.0                                                                               | 0.0                                                                               | 66.9                                                                                | 0.0                                                                                 | 0.0                                                                                 | 67.2                                                                                | 10.8                                                                                | 5.4                                                                                 |
| Incr Delay (d2), s/veh       | 4.9                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 29.4                                                                                | 1.9                                                                                 | 1.9                                                                                 | 20.3                                                                                | 1.0                                                                                 | 0.2                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 8.2                                                                               | 0.0                                                                               | 0.0                                                                               | 2.6                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                                 | 0.7                                                                                 | 0.7                                                                                 | 0.2                                                                                 | 24.0                                                                                | 3.2                                                                                 |
| LnGrp Delay(d),s/veh         | 59.5                                                                              | 0.0                                                                               | 0.0                                                                               | 49.7                                                                              | 0.0                                                                               | 0.0                                                                               | 96.3                                                                                | 1.9                                                                                 | 1.9                                                                                 | 87.4                                                                                | 11.8                                                                                | 5.6                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | F                                                                                   | A                                                                                   | A                                                                                   | F                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 215                                                                               |                                                                                   |                                                                                   |                                                                                   | 77                                                                                |                                                                                   | 1906                                                                                |                                                                                     |                                                                                     |                                                                                     | 2359                                                                                |                                                                                     |
| Approach Delay, s/veh        | 59.5                                                                              |                                                                                   |                                                                                   |                                                                                   | 49.7                                                                              |                                                                                   | 2.1                                                                                 |                                                                                     |                                                                                     |                                                                                     | 11.3                                                                                |                                                                                     |
| Approach LOS                 | E                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                   | A                                                                                   |                                                                                     |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 4                                                                                 |                                                                                   | 5                                                                                 | 6                                                                                 | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 4.5                                                                               | 104.2                                                                             | 26.3                                                                              |                                                                                   | 4.5                                                                               | 104.2                                                                             | 26.3                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   | 4.0                                                                               | 5.0                                                                               | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 8.0                                                                               | 84.0                                                                              | 29.0                                                                              |                                                                                   | 8.0                                                                               | 84.0                                                                              | 29.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.4                                                                               | 51.3                                                                              | 7.4                                                                               |                                                                                   | 2.4                                                                               | 2.0                                                                               | 20.8                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 30.9                                                                              | 0.2                                                                               |                                                                                   | 0.0                                                                               | 62.7                                                                              | 0.5                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 10.4                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 10: Honoapiilani Highway & Kapunakea Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |                                                                                     |  |  |                                                                                     |
| Traffic Volume (veh/h)       | 180                                                                               | 35                                                                                | 45                                                                                | 95                                                                                | 25                                                                                | 20                                                                                | 55                                                                                 | 1535                                                                                | 105                                                                                 | 25                                                                                  | 1845                                                                                | 150                                                                                 |
| Future Volume (veh/h)        | 180                                                                               | 35                                                                                | 45                                                                                | 95                                                                                | 25                                                                                | 20                                                                                | 55                                                                                 | 1535                                                                                | 105                                                                                 | 25                                                                                  | 1845                                                                                | 150                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                              |                                                                                   | 0.98                                                                              | 0.99                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 196                                                                               | 38                                                                                | 8                                                                                 | 103                                                                               | 27                                                                                | 2                                                                                 | 60                                                                                 | 1668                                                                                | 111                                                                                 | 27                                                                                  | 2005                                                                                | 159                                                                                 |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 268                                                                               | 43                                                                                | 307                                                                               | 355                                                                               | 340                                                                               | 25                                                                                | 76                                                                                 | 2336                                                                                | 154                                                                                 | 34                                                                                  | 2225                                                                                | 174                                                                                 |
| Arrive On Green              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.19                                                                              | 0.09                                                                               | 1.00                                                                                | 1.00                                                                                | 0.04                                                                                | 1.00                                                                                | 1.00                                                                                |
| Sat Flow, veh/h              | 1103                                                                              | 214                                                                               | 1545                                                                              | 1347                                                                              | 1710                                                                              | 127                                                                               | 1774                                                                               | 3370                                                                                | 223                                                                                 | 1774                                                                                | 3325                                                                                | 260                                                                                 |
| Grp Volume(v), veh/h         | 234                                                                               | 0                                                                                 | 8                                                                                 | 103                                                                               | 0                                                                                 | 29                                                                                | 60                                                                                 | 870                                                                                 | 909                                                                                 | 27                                                                                  | 1054                                                                                | 1110                                                                                |
| Grp Sat Flow(s),veh/h/ln     | 1317                                                                              | 0                                                                                 | 1545                                                                              | 1347                                                                              | 0                                                                                 | 1837                                                                              | 1774                                                                               | 1770                                                                                | 1823                                                                                | 1774                                                                                | 1770                                                                                | 1816                                                                                |
| Q Serve(g_s), s              | 21.9                                                                              | 0.0                                                                               | 0.6                                                                               | 0.0                                                                               | 0.0                                                                               | 1.7                                                                               | 4.5                                                                                | 0.0                                                                                 | 0.0                                                                                 | 2.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Cycle Q Clear(g_c), s        | 23.6                                                                              | 0.0                                                                               | 0.6                                                                               | 7.7                                                                               | 0.0                                                                               | 1.7                                                                               | 4.5                                                                                | 0.0                                                                                 | 0.0                                                                                 | 2.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Prop In Lane                 | 0.84                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.07                                                                              | 1.00                                                                               |                                                                                     | 0.12                                                                                | 1.00                                                                                |                                                                                     | 0.14                                                                                |
| Lane Grp Cap(c), veh/h       | 311                                                                               | 0                                                                                 | 307                                                                               | 355                                                                               | 0                                                                                 | 365                                                                               | 76                                                                                 | 1227                                                                                | 1264                                                                                | 34                                                                                  | 1184                                                                                | 1215                                                                                |
| V/C Ratio(X)                 | 0.75                                                                              | 0.00                                                                              | 0.03                                                                              | 0.29                                                                              | 0.00                                                                              | 0.08                                                                              | 0.79                                                                               | 0.71                                                                                | 0.72                                                                                | 0.80                                                                                | 0.89                                                                                | 0.91                                                                                |
| Avail Cap(c_a), veh/h        | 333                                                                               | 0                                                                                 | 332                                                                               | 377                                                                               | 0                                                                                 | 395                                                                               | 105                                                                                | 1227                                                                                | 1264                                                                                | 105                                                                                 | 1184                                                                                | 1215                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 2.00                                                                               | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.38                                                                               | 0.38                                                                                | 0.38                                                                                | 0.50                                                                                | 0.50                                                                                | 0.50                                                                                |
| Uniform Delay (d), s/veh     | 53.6                                                                              | 0.0                                                                               | 43.5                                                                              | 46.4                                                                              | 0.0                                                                               | 44.0                                                                              | 61.1                                                                               | 0.0                                                                                 | 0.0                                                                                 | 64.7                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Incr Delay (d2), s/veh       | 8.7                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.1                                                                               | 6.5                                                                                | 1.3                                                                                 | 1.4                                                                                 | 7.7                                                                                 | 5.5                                                                                 | 6.6                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 9.3                                                                               | 0.0                                                                               | 0.2                                                                               | 3.3                                                                               | 0.0                                                                               | 0.9                                                                               | 2.3                                                                                | 0.5                                                                                 | 0.5                                                                                 | 1.1                                                                                 | 1.8                                                                                 | 2.2                                                                                 |
| LnGrp Delay(d),s/veh         | 62.3                                                                              | 0.0                                                                               | 43.6                                                                              | 46.9                                                                              | 0.0                                                                               | 44.1                                                                              | 67.6                                                                               | 1.3                                                                                 | 1.4                                                                                 | 72.4                                                                                | 5.5                                                                                 | 6.6                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 |                                                                                   | D                                                                                 | E                                                                                  | A                                                                                   | A                                                                                   | E                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 242                                                                               |                                                                                   |                                                                                   | 132                                                                               |                                                                                   |                                                                                    | 1839                                                                                |                                                                                     |                                                                                     | 2191                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 61.7                                                                              |                                                                                   |                                                                                   | 46.3                                                                              |                                                                                   |                                                                                    | 3.5                                                                                 |                                                                                     |                                                                                     | 6.9                                                                                 |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                    | A                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 9.8                                                                               | 94.3                                                                              |                                                                                   | 30.9                                                                              | 6.6                                                                               | 97.6                                                                              |                                                                                    | 30.9                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 8.0                                                                               | 85.0                                                                              |                                                                                   | 28.0                                                                              | 8.0                                                                               | 85.0                                                                              |                                                                                    | 28.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 6.5                                                                               | 2.0                                                                               |                                                                                   | 9.7                                                                               | 4.0                                                                               | 2.0                                                                               |                                                                                    | 25.6                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 62.6                                                                              |                                                                                   | 0.4                                                                               | 0.0                                                                               | 43.1                                                                              |                                                                                    | 0.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 9.7                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 11: Honoapiilani Highway & Keawe Street

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 60                                                                                | 185                                                                               | 60                                                                                | 125                                                                               | 110                                                                               | 695                                                                               | 55                                                                                  | 940                                                                                 | 195                                                                                 | 630                                                                                 | 1225                                                                                | 65                                                                                  |
| Future Volume (veh/h)        | 60                                                                                | 185                                                                               | 60                                                                                | 125                                                                               | 110                                                                               | 695                                                                               | 55                                                                                  | 940                                                                                 | 195                                                                                 | 630                                                                                 | 1225                                                                                | 65                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                                |                                                                                     | 0.99                                                                                | 1.00                                                                                |                                                                                     | 0.99                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 65                                                                                | 201                                                                               | 8                                                                                 | 136                                                                               | 120                                                                               | 454                                                                               | 60                                                                                  | 1022                                                                                | 128                                                                                 | 685                                                                                 | 1332                                                                                | 69                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   | 2                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 97                                                                                | 239                                                                               | 317                                                                               | 234                                                                               | 589                                                                               | 492                                                                               | 77                                                                                  | 1361                                                                                | 604                                                                                 | 724                                                                                 | 1887                                                                                | 98                                                                                  |
| Arrive On Green              | 0.21                                                                              | 0.21                                                                              | 0.21                                                                              | 0.08                                                                              | 0.32                                                                              | 0.32                                                                              | 0.04                                                                                | 0.38                                                                                | 0.38                                                                                | 0.42                                                                                | 1.00                                                                                | 1.00                                                                                |
| Sat Flow, veh/h              | 310                                                                               | 1163                                                                              | 1542                                                                              | 1774                                                                              | 1863                                                                              | 1556                                                                              | 1774                                                                                | 3539                                                                                | 1571                                                                                | 3442                                                                                | 3423                                                                                | 177                                                                                 |
| Grp Volume(v), veh/h         | 266                                                                               | 0                                                                                 | 8                                                                                 | 136                                                                               | 120                                                                               | 454                                                                               | 60                                                                                  | 1022                                                                                | 128                                                                                 | 685                                                                                 | 687                                                                                 | 714                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1473                                                                              | 0                                                                                 | 1542                                                                              | 1774                                                                              | 1863                                                                              | 1556                                                                              | 1774                                                                                | 1770                                                                                | 1571                                                                                | 1721                                                                                | 1770                                                                                | 1830                                                                                |
| Q Serve(g_s), s              | 20.4                                                                              | 0.0                                                                               | 0.6                                                                               | 7.8                                                                               | 6.4                                                                               | 38.0                                                                              | 4.5                                                                                 | 33.7                                                                                | 7.4                                                                                 | 25.9                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Cycle Q Clear(g_c), s        | 23.5                                                                              | 0.0                                                                               | 0.6                                                                               | 7.8                                                                               | 6.4                                                                               | 38.0                                                                              | 4.5                                                                                 | 33.7                                                                                | 7.4                                                                                 | 25.9                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Prop In Lane                 | 0.24                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 0.10                                                                                |
| Lane Grp Cap(c), veh/h       | 336                                                                               | 0                                                                                 | 317                                                                               | 234                                                                               | 589                                                                               | 492                                                                               | 77                                                                                  | 1361                                                                                | 604                                                                                 | 724                                                                                 | 976                                                                                 | 1009                                                                                |
| V/C Ratio(X)                 | 0.79                                                                              | 0.00                                                                              | 0.03                                                                              | 0.58                                                                              | 0.20                                                                              | 0.92                                                                              | 0.78                                                                                | 0.75                                                                                | 0.21                                                                                | 0.95                                                                                | 0.70                                                                                | 0.71                                                                                |
| Avail Cap(c_a), veh/h        | 339                                                                               | 0                                                                                 | 320                                                                               | 301                                                                               | 662                                                                               | 553                                                                               | 237                                                                                 | 1361                                                                                | 604                                                                                 | 765                                                                                 | 976                                                                                 | 1009                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.88                                                                                | 0.88                                                                                | 0.88                                                                                | 0.31                                                                                | 0.31                                                                                | 0.31                                                                                |
| Uniform Delay (d), s/veh     | 51.6                                                                              | 0.0                                                                               | 42.8                                                                              | 38.4                                                                              | 33.7                                                                              | 44.6                                                                              | 63.9                                                                                | 36.0                                                                                | 27.8                                                                                | 38.4                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Incr Delay (d2), s/veh       | 12.0                                                                              | 0.0                                                                               | 0.0                                                                               | 2.3                                                                               | 0.2                                                                               | 19.9                                                                              | 5.4                                                                                 | 3.4                                                                                 | 0.7                                                                                 | 8.1                                                                                 | 1.3                                                                                 | 1.3                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 10.7                                                                              | 0.0                                                                               | 0.2                                                                               | 4.0                                                                               | 3.3                                                                               | 19.0                                                                              | 2.3                                                                                 | 17.1                                                                                | 3.3                                                                                 | 12.9                                                                                | 0.4                                                                                 | 0.4                                                                                 |
| LnGrp Delay(d),s/veh         | 63.6                                                                              | 0.0                                                                               | 42.9                                                                              | 40.7                                                                              | 33.9                                                                              | 64.4                                                                              | 69.3                                                                                | 39.4                                                                                | 28.6                                                                                | 46.4                                                                                | 1.3                                                                                 | 1.3                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 | C                                                                                 | E                                                                                 | E                                                                                   | D                                                                                   | C                                                                                   | D                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 274                                                                               |                                                                                   |                                                                                   | 710                                                                               |                                                                                   |                                                                                     | 1210                                                                                |                                                                                     |                                                                                     | 2086                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 63.0                                                                              |                                                                                   |                                                                                   | 54.7                                                                              |                                                                                   |                                                                                     | 39.7                                                                                |                                                                                     |                                                                                     | 16.1                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                     | D                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 9.9                                                                               | 78.4                                                                              | 15.0                                                                              | 31.7                                                                              | 32.4                                                                              | 55.9                                                                              |                                                                                     | 46.7                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 18.0                                                                              | 56.0                                                                              | 15.0                                                                              | 27.0                                                                              | 30.0                                                                              | 44.0                                                                              |                                                                                     | 47.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 6.5                                                                               | 2.0                                                                               | 9.8                                                                               | 25.5                                                                              | 27.9                                                                              | 35.7                                                                              |                                                                                     | 40.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.1                                                                               | 22.6                                                                              | 0.2                                                                               | 0.2                                                                               | 0.6                                                                               | 5.6                                                                               |                                                                                     | 1.7                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 32.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



---

## **APPENDIX C**

### LEVEL OF SERVICE CALCULATIONS

- Base Year 2022 with Mitigation WE Peak
-

# HCM 2010 Signalized Intersection Summary

## 1: Napilihau Street

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 40                                                                                | 45                                                                                | 330                                                                               | 45                                                                                | 50                                                                                | 20                                                                                | 270                                                                                 | 310                                                                                 | 40                                                                                  | 20                                                                                  | 280                                                                                 | 90                                                                                  |
| Future Volume (veh/h)        | 40                                                                                | 45                                                                                | 330                                                                               | 45                                                                                | 50                                                                                | 20                                                                                | 270                                                                                 | 310                                                                                 | 40                                                                                  | 20                                                                                  | 280                                                                                 | 90                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.99                                                                              | 0.99                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 43                                                                                | 49                                                                                | 35                                                                                | 49                                                                                | 54                                                                                | 10                                                                                | 293                                                                                 | 337                                                                                 | 22                                                                                  | 22                                                                                  | 304                                                                                 | 28                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 193                                                                               | 136                                                                               | 204                                                                               | 268                                                                               | 199                                                                               | 37                                                                                | 380                                                                                 | 905                                                                                 | 767                                                                                 | 29                                                                                  | 536                                                                                 | 455                                                                                 |
| Arrive On Green              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.21                                                                                | 0.49                                                                                | 0.49                                                                                | 0.02                                                                                | 0.29                                                                                | 0.29                                                                                |
| Sat Flow, veh/h              | 552                                                                               | 1045                                                                              | 1566                                                                              | 1298                                                                              | 1527                                                                              | 283                                                                               | 1774                                                                                | 1863                                                                                | 1580                                                                                | 1774                                                                                | 1863                                                                                | 1581                                                                                |
| Grp Volume(v), veh/h         | 92                                                                                | 0                                                                                 | 35                                                                                | 49                                                                                | 0                                                                                 | 64                                                                                | 293                                                                                 | 337                                                                                 | 22                                                                                  | 22                                                                                  | 304                                                                                 | 28                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1596                                                                              | 0                                                                                 | 1566                                                                              | 1298                                                                              | 0                                                                                 | 1809                                                                              | 1774                                                                                | 1863                                                                                | 1580                                                                                | 1774                                                                                | 1863                                                                                | 1581                                                                                |
| Q Serve(g_s), s              | 0.8                                                                               | 0.0                                                                               | 0.9                                                                               | 1.6                                                                               | 0.0                                                                               | 1.4                                                                               | 6.8                                                                                 | 4.9                                                                                 | 0.3                                                                                 | 0.5                                                                                 | 6.0                                                                                 | 0.6                                                                                 |
| Cycle Q Clear(g_c), s        | 2.2                                                                               | 0.0                                                                               | 0.9                                                                               | 3.8                                                                               | 0.0                                                                               | 1.4                                                                               | 6.8                                                                                 | 4.9                                                                                 | 0.3                                                                                 | 0.5                                                                                 | 6.0                                                                                 | 0.6                                                                                 |
| Prop In Lane                 | 0.47                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.16                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 330                                                                               | 0                                                                                 | 204                                                                               | 268                                                                               | 0                                                                                 | 236                                                                               | 380                                                                                 | 905                                                                                 | 767                                                                                 | 29                                                                                  | 536                                                                                 | 455                                                                                 |
| V/C Ratio(X)                 | 0.28                                                                              | 0.00                                                                              | 0.17                                                                              | 0.18                                                                              | 0.00                                                                              | 0.27                                                                              | 0.77                                                                                | 0.37                                                                                | 0.03                                                                                | 0.77                                                                                | 0.57                                                                                | 0.06                                                                                |
| Avail Cap(c_a), veh/h        | 988                                                                               | 0                                                                                 | 864                                                                               | 815                                                                               | 0                                                                                 | 998                                                                               | 1224                                                                                | 3384                                                                                | 2870                                                                                | 612                                                                                 | 2741                                                                                | 2326                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 17.4                                                                              | 0.0                                                                               | 16.8                                                                              | 19.2                                                                              | 0.0                                                                               | 17.0                                                                              | 16.1                                                                                | 7.0                                                                                 | 5.8                                                                                 | 21.3                                                                                | 13.2                                                                                | 11.2                                                                                |
| Incr Delay (d2), s/veh       | 0.5                                                                               | 0.0                                                                               | 0.4                                                                               | 0.3                                                                               | 0.0                                                                               | 0.6                                                                               | 3.4                                                                                 | 0.5                                                                                 | 0.0                                                                                 | 34.3                                                                                | 2.0                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.1                                                                               | 0.0                                                                               | 0.4                                                                               | 0.6                                                                               | 0.0                                                                               | 0.7                                                                               | 3.6                                                                                 | 2.7                                                                                 | 0.1                                                                                 | 0.5                                                                                 | 3.3                                                                                 | 0.3                                                                                 |
| LnGrp Delay(d),s/veh         | 17.8                                                                              | 0.0                                                                               | 17.2                                                                              | 19.5                                                                              | 0.0                                                                               | 17.7                                                                              | 19.5                                                                                | 7.6                                                                                 | 5.9                                                                                 | 55.6                                                                                | 15.2                                                                                | 11.3                                                                                |
| LnGrp LOS                    | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 127                                                                               |                                                                                   |                                                                                   | 113                                                                               |                                                                                   |                                                                                     | 652                                                                                 |                                                                                     |                                                                                     | 354                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 17.7                                                                              |                                                                                   |                                                                                   | 18.5                                                                              |                                                                                   |                                                                                     | 12.9                                                                                |                                                                                     |                                                                                     | 17.4                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.7                                                                               | 27.1                                                                              |                                                                                   | 10.7                                                                              | 14.3                                                                              | 18.5                                                                              |                                                                                     | 10.7                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 79.0                                                                              |                                                                                   | 24.0                                                                              | 30.0                                                                              | 64.0                                                                              |                                                                                     | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.5                                                                               | 6.9                                                                               |                                                                                   | 4.2                                                                               | 8.8                                                                               | 8.0                                                                               |                                                                                     | 5.8                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 4.8                                                                               |                                                                                   | 0.5                                                                               | 0.8                                                                               | 4.2                                                                               |                                                                                     | 0.4                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 15.1                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## HCM 2010 Signalized Intersection Summary 2: Hoohui Road

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 55                                                                                | 20                                                                                | 195                                                                               | 40                                                                                | 15                                                                                | 5                                                                                 | 135                                                                                 | 445                                                                                 | 25                                                                                  | 15                                                                                  | 485                                                                                 | 60                                                                                  |
| Future Volume (veh/h)        | 55                                                                                | 20                                                                                | 195                                                                               | 40                                                                                | 15                                                                                | 5                                                                                 | 135                                                                                 | 445                                                                                 | 25                                                                                  | 15                                                                                  | 485                                                                                 | 60                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                              |                                                                                   | 0.98                                                                              | 0.99                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 60                                                                                | 22                                                                                | 23                                                                                | 43                                                                                | 16                                                                                | 1                                                                                 | 147                                                                                 | 484                                                                                 | 0                                                                                   | 16                                                                                  | 527                                                                                 | 25                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 291                                                                               | 84                                                                                | 232                                                                               | 310                                                                               | 259                                                                               | 16                                                                                | 443                                                                                 | 854                                                                                 | 726                                                                                 | 436                                                                                 | 721                                                                                 | 611                                                                                 |
| Arrive On Green              | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.08                                                                                | 0.46                                                                                | 0.00                                                                                | 0.01                                                                                | 0.39                                                                                | 0.39                                                                                |
| Sat Flow, veh/h              | 954                                                                               | 564                                                                               | 1557                                                                              | 1337                                                                              | 1733                                                                              | 108                                                                               | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1577                                                                                |
| Grp Volume(v), veh/h         | 82                                                                                | 0                                                                                 | 23                                                                                | 43                                                                                | 0                                                                                 | 17                                                                                | 147                                                                                 | 484                                                                                 | 0                                                                                   | 16                                                                                  | 527                                                                                 | 25                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1518                                                                              | 0                                                                                 | 1557                                                                              | 1337                                                                              | 0                                                                                 | 1841                                                                              | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1577                                                                                |
| Q Serve(g_s), s              | 1.2                                                                               | 0.0                                                                               | 0.5                                                                               | 1.3                                                                               | 0.0                                                                               | 0.3                                                                               | 2.0                                                                                 | 8.0                                                                                 | 0.0                                                                                 | 0.2                                                                                 | 10.2                                                                                | 0.4                                                                                 |
| Cycle Q Clear(g_c), s        | 1.9                                                                               | 0.0                                                                               | 0.5                                                                               | 3.2                                                                               | 0.0                                                                               | 0.3                                                                               | 2.0                                                                                 | 8.0                                                                                 | 0.0                                                                                 | 0.2                                                                                 | 10.2                                                                                | 0.4                                                                                 |
| Prop In Lane                 | 0.73                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 375                                                                               | 0                                                                                 | 232                                                                               | 310                                                                               | 0                                                                                 | 275                                                                               | 443                                                                                 | 854                                                                                 | 726                                                                                 | 436                                                                                 | 721                                                                                 | 611                                                                                 |
| V/C Ratio(X)                 | 0.22                                                                              | 0.00                                                                              | 0.10                                                                              | 0.14                                                                              | 0.00                                                                              | 0.06                                                                              | 0.33                                                                                | 0.57                                                                                | 0.00                                                                                | 0.04                                                                                | 0.73                                                                                | 0.04                                                                                |
| Avail Cap(c_a), veh/h        | 1030                                                                              | 0                                                                                 | 925                                                                               | 905                                                                               | 0                                                                                 | 1094                                                                              | 927                                                                                 | 2258                                                                                | 1920                                                                                | 1047                                                                                | 2258                                                                                | 1912                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 0.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 16.0                                                                              | 0.0                                                                               | 15.5                                                                              | 17.5                                                                              | 0.0                                                                               | 15.4                                                                              | 7.9                                                                                 | 8.3                                                                                 | 0.0                                                                                 | 8.0                                                                                 | 11.0                                                                                | 8.0                                                                                 |
| Incr Delay (d2), s/veh       | 0.3                                                                               | 0.0                                                                               | 0.2                                                                               | 0.2                                                                               | 0.0                                                                               | 0.1                                                                               | 0.4                                                                                 | 0.6                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 1.4                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.9                                                                               | 0.0                                                                               | 0.2                                                                               | 0.5                                                                               | 0.0                                                                               | 0.2                                                                               | 1.0                                                                                 | 4.2                                                                                 | 0.0                                                                                 | 0.1                                                                                 | 5.4                                                                                 | 0.2                                                                                 |
| LnGrp Delay(d),s/veh         | 16.3                                                                              | 0.0                                                                               | 15.6                                                                              | 17.7                                                                              | 0.0                                                                               | 15.5                                                                              | 8.4                                                                                 | 8.9                                                                                 | 0.0                                                                                 | 8.0                                                                                 | 12.5                                                                                | 8.1                                                                                 |
| LnGrp LOS                    | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                 |                                                                                   | B                                                                                 | A                                                                                   | A                                                                                   |                                                                                     | A                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 105                                                                               |                                                                                   |                                                                                   | 60                                                                                |                                                                                   |                                                                                     | 631                                                                                 |                                                                                     |                                                                                     | 568                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 16.1                                                                              |                                                                                   |                                                                                   | 17.0                                                                              |                                                                                   |                                                                                     | 8.8                                                                                 |                                                                                     |                                                                                     | 12.1                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.5                                                                               | 25.3                                                                              |                                                                                   | 11.3                                                                              | 8.5                                                                               | 22.3                                                                              |                                                                                     | 11.3                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 51.0                                                                              |                                                                                   | 25.0                                                                              | 15.0                                                                              | 51.0                                                                              |                                                                                     | 25.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.2                                                                               | 10.0                                                                              |                                                                                   | 3.9                                                                               | 4.0                                                                               | 12.2                                                                              |                                                                                     | 5.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 3.3                                                                               |                                                                                   | 0.4                                                                               | 0.3                                                                               | 3.8                                                                               |                                                                                     | 0.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 11.1                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 3: Honoapiilani Highway & Akahele Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 40                                                                                | 5                                                                                 | 85                                                                                | 10                                                                                | 5                                                                                 | 10                                                                                | 80                                                                                 | 550                                                                                 | 15                                                                                  | 5                                                                                   | 675                                                                                 | 50                                                                                  |
| Future Volume (veh/h)        | 40                                                                                | 5                                                                                 | 85                                                                                | 10                                                                                | 5                                                                                 | 10                                                                                | 80                                                                                 | 550                                                                                 | 15                                                                                  | 5                                                                                   | 675                                                                                 | 50                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                  | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 43                                                                                | 5                                                                                 | 7                                                                                 | 11                                                                                | 5                                                                                 | 1                                                                                 | 87                                                                                 | 598                                                                                 | 9                                                                                   | 5                                                                                   | 734                                                                                 | 26                                                                                  |
| Adj No. of Lanes             | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 61                                                                                | 78                                                                                | 110                                                                               | 20                                                                                | 166                                                                               | 141                                                                               | 115                                                                                | 1000                                                                                | 850                                                                                 | 7                                                                                   | 887                                                                                 | 753                                                                                 |
| Arrive On Green              | 0.03                                                                              | 0.11                                                                              | 0.11                                                                              | 0.01                                                                              | 0.09                                                                              | 0.09                                                                              | 0.06                                                                               | 0.54                                                                                | 0.54                                                                                | 0.00                                                                                | 0.48                                                                                | 0.48                                                                                |
| Sat Flow, veh/h              | 1774                                                                              | 700                                                                               | 980                                                                               | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1582                                                                                |
| Grp Volume(v), veh/h         | 43                                                                                | 0                                                                                 | 12                                                                                | 11                                                                                | 5                                                                                 | 1                                                                                 | 87                                                                                 | 598                                                                                 | 9                                                                                   | 5                                                                                   | 734                                                                                 | 26                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1774                                                                              | 0                                                                                 | 1679                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1582                                                                                |
| Q Serve(g_s), s              | 1.4                                                                               | 0.0                                                                               | 0.4                                                                               | 0.4                                                                               | 0.1                                                                               | 0.0                                                                               | 2.9                                                                                | 13.0                                                                                | 0.2                                                                                 | 0.2                                                                                 | 20.3                                                                                | 0.5                                                                                 |
| Cycle Q Clear(g_c), s        | 1.4                                                                               | 0.0                                                                               | 0.4                                                                               | 0.4                                                                               | 0.1                                                                               | 0.0                                                                               | 2.9                                                                                | 13.0                                                                                | 0.2                                                                                 | 0.2                                                                                 | 20.3                                                                                | 0.5                                                                                 |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 0.58                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 61                                                                                | 0                                                                                 | 188                                                                               | 20                                                                                | 166                                                                               | 141                                                                               | 115                                                                                | 1000                                                                                | 850                                                                                 | 7                                                                                   | 887                                                                                 | 753                                                                                 |
| V/C Ratio(X)                 | 0.71                                                                              | 0.00                                                                              | 0.06                                                                              | 0.55                                                                              | 0.03                                                                              | 0.01                                                                              | 0.76                                                                               | 0.60                                                                                | 0.01                                                                                | 0.70                                                                                | 0.83                                                                                | 0.03                                                                                |
| Avail Cap(c_a), veh/h        | 596                                                                               | 0                                                                                 | 592                                                                               | 596                                                                               | 657                                                                               | 558                                                                               | 745                                                                                | 2033                                                                                | 1728                                                                                | 745                                                                                 | 2033                                                                                | 1727                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 28.5                                                                              | 0.0                                                                               | 23.6                                                                              | 29.3                                                                              | 24.8                                                                              | 24.7                                                                              | 27.4                                                                               | 9.4                                                                                 | 6.4                                                                                 | 29.6                                                                                | 13.5                                                                                | 8.3                                                                                 |
| Incr Delay (d2), s/veh       | 14.1                                                                              | 0.0                                                                               | 0.1                                                                               | 22.0                                                                              | 0.1                                                                               | 0.0                                                                               | 9.7                                                                                | 0.6                                                                                 | 0.0                                                                                 | 81.2                                                                                | 2.0                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.9                                                                               | 0.0                                                                               | 0.2                                                                               | 0.3                                                                               | 0.1                                                                               | 0.0                                                                               | 1.7                                                                                | 6.8                                                                                 | 0.1                                                                                 | 0.2                                                                                 | 10.7                                                                                | 0.2                                                                                 |
| LnGrp Delay(d),s/veh         | 42.6                                                                              | 0.0                                                                               | 23.8                                                                              | 51.3                                                                              | 24.8                                                                              | 24.7                                                                              | 37.1                                                                               | 10.0                                                                                | 6.4                                                                                 | 110.8                                                                               | 15.5                                                                                | 8.3                                                                                 |
| LnGrp LOS                    | D                                                                                 |                                                                                   | C                                                                                 | D                                                                                 | C                                                                                 | C                                                                                 | D                                                                                  | A                                                                                   | A                                                                                   | F                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 55                                                                                |                                                                                   |                                                                                   | 17                                                                                |                                                                                   |                                                                                   | 694                                                                                |                                                                                     |                                                                                     | 765                                                                                 |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 38.5                                                                              |                                                                                   |                                                                                   | 42.0                                                                              |                                                                                   |                                                                                   | 13.3                                                                               |                                                                                     |                                                                                     | 15.9                                                                                |                                                                                     |                                                                                     |
| Approach LOS                 | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | B                                                                                  |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.2                                                                               | 37.0                                                                              | 5.7                                                                               | 11.7                                                                              | 8.9                                                                               | 33.4                                                                              | 7.0                                                                                | 10.3                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              | 25.0                                                                              | 65.0                                                                              | 20.0                                                                               | 21.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.2                                                                               | 15.0                                                                              | 2.4                                                                               | 2.4                                                                               | 4.9                                                                               | 22.3                                                                              | 3.4                                                                                | 2.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 4.5                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                               | 6.1                                                                               | 0.1                                                                                | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          | 15.8                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 4: Honoapiilani Highway & Lower Honoapiilani Road

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 50                                                                                | 10                                                                                | 595                                                                               | 10                                                                                | 0                                                                                 | 5                                                                                 | 410                                                                                 | 595                                                                                 | 5                                                                                   | 0                                                                                   | 730                                                                                 | 50                                                                                  |
| Future Volume (veh/h)        | 50                                                                                | 10                                                                                | 595                                                                               | 10                                                                                | 0                                                                                 | 5                                                                                 | 410                                                                                 | 595                                                                                 | 5                                                                                   | 0                                                                                   | 730                                                                                 | 50                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 54                                                                                | 11                                                                                | 0                                                                                 | 11                                                                                | 0                                                                                 | 1                                                                                 | 446                                                                                 | 647                                                                                 | 5                                                                                   | 0                                                                                   | 793                                                                                 | 17                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 190                                                                               | 15                                                                                | 97                                                                                | 206                                                                               | 4                                                                                 | 8                                                                                 | 516                                                                                 | 2695                                                                                | 21                                                                                  | 3                                                                                   | 1376                                                                                | 613                                                                                 |
| Arrive On Green              | 0.08                                                                              | 0.06                                                                              | 0.00                                                                              | 0.08                                                                              | 0.00                                                                              | 0.06                                                                              | 0.29                                                                                | 0.75                                                                                | 0.75                                                                                | 0.00                                                                                | 0.39                                                                                | 0.39                                                                                |
| Sat Flow, veh/h              | 1239                                                                              | 252                                                                               | 1583                                                                              | 1407                                                                              | 67                                                                                | 134                                                                               | 1774                                                                                | 3600                                                                                | 28                                                                                  | 1774                                                                                | 3539                                                                                | 1577                                                                                |
| Grp Volume(v), veh/h         | 65                                                                                | 0                                                                                 | 0                                                                                 | 12                                                                                | 0                                                                                 | 0                                                                                 | 446                                                                                 | 318                                                                                 | 334                                                                                 | 0                                                                                   | 793                                                                                 | 17                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1491                                                                              | 0                                                                                 | 1583                                                                              | 1608                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1858                                                                                | 1774                                                                                | 1770                                                                                | 1577                                                                                |
| Q Serve(g_s), s              | 2.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 13.8                                                                                | 3.2                                                                                 | 3.2                                                                                 | 0.0                                                                                 | 10.2                                                                                | 0.4                                                                                 |
| Cycle Q Clear(g_c), s        | 2.4                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 13.8                                                                                | 3.2                                                                                 | 3.2                                                                                 | 0.0                                                                                 | 10.2                                                                                | 0.4                                                                                 |
| Prop In Lane                 | 0.83                                                                              |                                                                                   | 1.00                                                                              | 0.92                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                                |                                                                                     | 0.01                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 231                                                                               | 0                                                                                 | 97                                                                                | 246                                                                               | 0                                                                                 | 0                                                                                 | 516                                                                                 | 1325                                                                                | 1391                                                                                | 3                                                                                   | 1376                                                                                | 613                                                                                 |
| V/C Ratio(X)                 | 0.28                                                                              | 0.00                                                                              | 0.00                                                                              | 0.05                                                                              | 0.00                                                                              | 0.00                                                                              | 0.87                                                                                | 0.24                                                                                | 0.24                                                                                | 0.00                                                                                | 0.58                                                                                | 0.03                                                                                |
| Avail Cap(c_a), veh/h        | 648                                                                               | 0                                                                                 | 547                                                                               | 769                                                                               | 0                                                                                 | 0                                                                                 | 2176                                                                                | 2110                                                                                | 2215                                                                                | 2176                                                                                | 4219                                                                                | 1880                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 0.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 26.2                                                                              | 0.0                                                                               | 0.0                                                                               | 25.2                                                                              | 0.0                                                                               | 0.0                                                                               | 19.5                                                                                | 2.2                                                                                 | 2.2                                                                                 | 0.0                                                                                 | 13.9                                                                                | 10.9                                                                                |
| Incr Delay (d2), s/veh       | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 1.7                                                                                 | 0.2                                                                                 | 0.2                                                                                 | 0.0                                                                                 | 0.8                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 6.9                                                                                 | 1.6                                                                                 | 1.7                                                                                 | 0.0                                                                                 | 5.1                                                                                 | 0.2                                                                                 |
| LnGrp Delay(d),s/veh         | 26.8                                                                              | 0.0                                                                               | 0.0                                                                               | 25.3                                                                              | 0.0                                                                               | 0.0                                                                               | 21.2                                                                                | 2.4                                                                                 | 2.4                                                                                 | 0.0                                                                                 | 14.7                                                                                | 11.0                                                                                |
| LnGrp LOS                    | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                   | A                                                                                   | A                                                                                   |                                                                                     | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 65                                                                                |                                                                                   |                                                                                   | 12                                                                                |                                                                                   |                                                                                     | 1098                                                                                |                                                                                     |                                                                                     | 810                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 26.8                                                                              |                                                                                   |                                                                                   | 25.3                                                                              |                                                                                   |                                                                                     | 10.1                                                                                |                                                                                     |                                                                                     | 14.7                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 20.8                                                                              | 28.5                                                                              |                                                                                   | 8.6                                                                               | 0.0                                                                               | 49.3                                                                              |                                                                                     | 8.6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 71.0                                                                              | 69.0                                                                              |                                                                                   | 25.0                                                                              | 71.0                                                                              | 69.0                                                                              |                                                                                     | 20.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 15.8                                                                              | 12.2                                                                              |                                                                                   | 2.4                                                                               | 0.0                                                                               | 5.2                                                                               |                                                                                     | 4.4                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 1.0                                                                               | 10.3                                                                              |                                                                                   | 0.0                                                                               | 0.0                                                                               | 7.0                                                                               |                                                                                     | 0.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 12.6                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 5: Honoapiilani Highway & Halawai Drive

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 55                                                                                | 5                                                                                 | 145                                                                               | 15                                                                                | 5                                                                                 | 15                                                                                | 105                                                                                | 950                                                                                 | 20                                                                                  | 10                                                                                  | 1295                                                                                | 65                                                                                  |
| Future Volume (veh/h)        | 55                                                                                | 5                                                                                 | 145                                                                               | 15                                                                                | 5                                                                                 | 15                                                                                | 105                                                                                | 950                                                                                 | 20                                                                                  | 10                                                                                  | 1295                                                                                | 65                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                              |                                                                                   | 1.00                                                                              | 0.98                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 60                                                                                | 5                                                                                 | -3                                                                                | 16                                                                                | 5                                                                                 | 1                                                                                 | 114                                                                                | 1033                                                                                | 21                                                                                  | 11                                                                                  | 1408                                                                                | 38                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 215                                                                               | 14                                                                                | 143                                                                               | 181                                                                               | 45                                                                                | 7                                                                                 | 146                                                                                | 2497                                                                                | 51                                                                                  | 15                                                                                  | 2228                                                                                | 994                                                                                 |
| Arrive On Green              | 0.10                                                                              | 0.09                                                                              | 0.00                                                                              | 0.10                                                                              | 0.09                                                                              | 0.09                                                                              | 0.08                                                                               | 0.70                                                                                | 0.70                                                                                | 0.01                                                                                | 0.63                                                                                | 0.63                                                                                |
| Sat Flow, veh/h              | 1294                                                                              | 150                                                                               | 1583                                                                              | 1030                                                                              | 499                                                                               | 73                                                                                | 1774                                                                               | 3548                                                                                | 72                                                                                  | 1774                                                                                | 3539                                                                                | 1580                                                                                |
| Grp Volume(v), veh/h         | 65                                                                                | 0                                                                                 | -3                                                                                | 22                                                                                | 0                                                                                 | 0                                                                                 | 114                                                                                | 515                                                                                 | 539                                                                                 | 11                                                                                  | 1408                                                                                | 38                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1444                                                                              | 0                                                                                 | 1583                                                                              | 1601                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                               | 1770                                                                                | 1850                                                                                | 1774                                                                                | 1770                                                                                | 1580                                                                                |
| Q Serve(g_s), s              | 2.1                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 4.5                                                                                | 8.6                                                                                 | 8.6                                                                                 | 0.4                                                                                 | 17.3                                                                                | 0.6                                                                                 |
| Cycle Q Clear(g_c), s        | 2.9                                                                               | 0.0                                                                               | 0.0                                                                               | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 4.5                                                                                | 8.6                                                                                 | 8.6                                                                                 | 0.4                                                                                 | 17.3                                                                                | 0.6                                                                                 |
| Prop In Lane                 | 0.92                                                                              |                                                                                   | 1.00                                                                              | 0.73                                                                              |                                                                                   | 0.05                                                                              | 1.00                                                                               |                                                                                     | 0.04                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 249                                                                               | 0                                                                                 | 143                                                                               | 255                                                                               | 0                                                                                 | 0                                                                                 | 146                                                                                | 1245                                                                                | 1302                                                                                | 15                                                                                  | 2228                                                                                | 994                                                                                 |
| V/C Ratio(X)                 | 0.26                                                                              | 0.00                                                                              | -0.02                                                                             | 0.09                                                                              | 0.00                                                                              | 0.00                                                                              | 0.78                                                                               | 0.41                                                                                | 0.41                                                                                | 0.75                                                                                | 0.63                                                                                | 0.04                                                                                |
| Avail Cap(c_a), veh/h        | 578                                                                               | 0                                                                                 | 514                                                                               | 602                                                                               | 0                                                                                 | 0                                                                                 | 526                                                                                | 2149                                                                                | 2247                                                                                | 276                                                                                 | 3798                                                                                | 1695                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 30.1                                                                              | 0.0                                                                               | 0.0                                                                               | 29.3                                                                              | 0.0                                                                               | 0.0                                                                               | 31.9                                                                               | 4.4                                                                                 | 4.4                                                                                 | 35.0                                                                                | 8.1                                                                                 | 5.0                                                                                 |
| Incr Delay (d2), s/veh       | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 3.4                                                                                | 0.5                                                                                 | 0.5                                                                                 | 24.5                                                                                | 0.6                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.2                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 2.3                                                                                | 4.3                                                                                 | 4.5                                                                                 | 0.3                                                                                 | 8.6                                                                                 | 0.3                                                                                 |
| LnGrp Delay(d),s/veh         | 30.3                                                                              | 0.0                                                                               | 0.0                                                                               | 29.4                                                                              | 0.0                                                                               | 0.0                                                                               | 35.2                                                                               | 4.9                                                                                 | 4.8                                                                                 | 59.6                                                                                | 8.7                                                                                 | 5.0                                                                                 |
| LnGrp LOS                    | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | D                                                                                  | A                                                                                   | A                                                                                   | E                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 62                                                                                |                                                                                   |                                                                                   | 22                                                                                |                                                                                   |                                                                                    | 1168                                                                                |                                                                                     |                                                                                     | 1457                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 31.8                                                                              |                                                                                   |                                                                                   | 29.4                                                                              |                                                                                   |                                                                                    | 7.8                                                                                 |                                                                                     |                                                                                     | 9.0                                                                                 |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                    | A                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 9.8                                                                               | 49.6                                                                              |                                                                                   | 11.4                                                                              | 4.6                                                                               | 54.8                                                                              |                                                                                    | 11.4                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 21.0                                                                              | 76.0                                                                              |                                                                                   | 23.0                                                                              | 11.0                                                                              | 86.0                                                                              |                                                                                    | 23.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 6.5                                                                               | 19.3                                                                              |                                                                                   | 2.8                                                                               | 2.4                                                                               | 10.6                                                                              |                                                                                    | 4.9                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.1                                                                               | 25.3                                                                              |                                                                                   | 0.0                                                                               | 0.0                                                                               | 14.4                                                                              |                                                                                    | 0.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 9.2                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 6: Honoapiilani Highway & Kai Ala Drive/Puukolii Road

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 60                                                                                | 5                                                                                 | 180                                                                               | 45                                                                                | 5                                                                                 | 35                                                                                | 110                                                                                | 1025                                                                                | 50                                                                                  | 30                                                                                  | 1375                                                                                | 75                                                                                  |
| Future Volume (veh/h)        | 60                                                                                | 5                                                                                 | 180                                                                               | 45                                                                                | 5                                                                                 | 35                                                                                | 110                                                                                | 1025                                                                                | 50                                                                                  | 30                                                                                  | 1375                                                                                | 75                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 65                                                                                | 5                                                                                 | 12                                                                                | 49                                                                                | 5                                                                                 | 2                                                                                 | 120                                                                                | 1114                                                                                | 34                                                                                  | 33                                                                                  | 1495                                                                                | 45                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 2                                                                                   | 1                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 275                                                                               | 18                                                                                | 232                                                                               | 230                                                                               | 186                                                                               | 75                                                                                | 154                                                                                | 2255                                                                                | 1009                                                                                | 57                                                                                  | 2062                                                                                | 922                                                                                 |
| Arrive On Green              | 0.16                                                                              | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.09                                                                               | 0.64                                                                                | 0.64                                                                                | 0.03                                                                                | 0.58                                                                                | 0.58                                                                                |
| Sat Flow, veh/h              | 1293                                                                              | 121                                                                               | 1577                                                                              | 1386                                                                              | 1265                                                                              | 506                                                                               | 1774                                                                               | 3539                                                                                | 1583                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 70                                                                                | 0                                                                                 | 12                                                                                | 49                                                                                | 0                                                                                 | 7                                                                                 | 120                                                                                | 1114                                                                                | 34                                                                                  | 33                                                                                  | 1495                                                                                | 45                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1415                                                                              | 0                                                                                 | 1577                                                                              | 1386                                                                              | 0                                                                                 | 1771                                                                              | 1774                                                                               | 1770                                                                                | 1583                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 3.4                                                                               | 0.0                                                                               | 0.5                                                                               | 2.7                                                                               | 0.0                                                                               | 0.3                                                                               | 5.4                                                                                | 13.6                                                                                | 0.7                                                                                 | 1.5                                                                                 | 25.0                                                                                | 1.0                                                                                 |
| Cycle Q Clear(g_c), s        | 3.6                                                                               | 0.0                                                                               | 0.5                                                                               | 6.3                                                                               | 0.0                                                                               | 0.3                                                                               | 5.4                                                                                | 13.6                                                                                | 0.7                                                                                 | 1.5                                                                                 | 25.0                                                                                | 1.0                                                                                 |
| Prop In Lane                 | 0.93                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.29                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 311                                                                               | 0                                                                                 | 232                                                                               | 230                                                                               | 0                                                                                 | 261                                                                               | 154                                                                                | 2255                                                                                | 1009                                                                                | 57                                                                                  | 2062                                                                                | 922                                                                                 |
| V/C Ratio(X)                 | 0.23                                                                              | 0.00                                                                              | 0.05                                                                              | 0.21                                                                              | 0.00                                                                              | 0.03                                                                              | 0.78                                                                               | 0.49                                                                                | 0.03                                                                                | 0.58                                                                                | 0.73                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h        | 519                                                                               | 0                                                                                 | 463                                                                               | 433                                                                               | 0                                                                                 | 520                                                                               | 456                                                                                | 2986                                                                                | 1336                                                                                | 260                                                                                 | 2596                                                                                | 1162                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 30.9                                                                              | 0.0                                                                               | 30.0                                                                              | 34.1                                                                              | 0.0                                                                               | 29.9                                                                              | 36.6                                                                               | 7.9                                                                                 | 5.5                                                                                 | 39.0                                                                                | 12.3                                                                                | 7.3                                                                                 |
| Incr Delay (d2), s/veh       | 0.4                                                                               | 0.0                                                                               | 0.1                                                                               | 0.5                                                                               | 0.0                                                                               | 0.0                                                                               | 3.2                                                                                | 0.4                                                                                 | 0.0                                                                                 | 3.4                                                                                 | 1.2                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.4                                                                               | 0.0                                                                               | 0.2                                                                               | 1.1                                                                               | 0.0                                                                               | 0.1                                                                               | 2.8                                                                                | 6.6                                                                                 | 0.3                                                                                 | 0.8                                                                                 | 12.4                                                                                | 0.4                                                                                 |
| LnGrp Delay(d),s/veh         | 31.3                                                                              | 0.0                                                                               | 30.1                                                                              | 34.6                                                                              | 0.0                                                                               | 29.9                                                                              | 39.8                                                                               | 8.2                                                                                 | 5.5                                                                                 | 42.4                                                                                | 13.6                                                                                | 7.4                                                                                 |
| LnGrp LOS                    | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                 |                                                                                   | C                                                                                 | D                                                                                  | A                                                                                   | A                                                                                   | D                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 82                                                                                |                                                                                   |                                                                                   | 56                                                                                |                                                                                   |                                                                                    | 1268                                                                                |                                                                                     |                                                                                     | 1573                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 31.1                                                                              |                                                                                   |                                                                                   | 34.0                                                                              |                                                                                   |                                                                                    | 11.1                                                                                |                                                                                     |                                                                                     | 14.0                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 11.1                                                                              | 53.6                                                                              |                                                                                   | 17.0                                                                              | 6.6                                                                               | 58.1                                                                              |                                                                                    | 17.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 21.0                                                                              | 60.0                                                                              |                                                                                   | 24.0                                                                              | 12.0                                                                              | 69.0                                                                              |                                                                                    | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 7.4                                                                               | 27.0                                                                              |                                                                                   | 8.3                                                                               | 3.5                                                                               | 15.6                                                                              |                                                                                    | 5.6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.2                                                                               | 20.7                                                                              |                                                                                   | 0.1                                                                               | 0.0                                                                               | 17.1                                                                              |                                                                                    | 0.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   |                                                                                   | 13.6                                                                              |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 7: Honoapiilani Highway & Kaanapali Parkway/Halelo Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |  |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 235                                                                               | 5                                                                                 | 445                                                                               | 15                                                                                | 5                                                                                 | 20                                                                                | 290                                                                                | 1150                                                                                | 15                                                                                  | 55                                                                                  | 1380                                                                                | 155                                                                                 |
| Future Volume (veh/h)        | 235                                                                               | 5                                                                                 | 445                                                                               | 15                                                                                | 5                                                                                 | 20                                                                                | 290                                                                                | 1150                                                                                | 15                                                                                  | 55                                                                                  | 1380                                                                                | 155                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 259                                                                               | 0                                                                                 | 268                                                                               | 16                                                                                | 5                                                                                 | 7                                                                                 | 315                                                                                | 1250                                                                                | 16                                                                                  | 60                                                                                  | 1500                                                                                | 134                                                                                 |
| Adj No. of Lanes             | 2                                                                                 | 0                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 2                                                                                  | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 448                                                                               | 0                                                                                 | 782                                                                               | 51                                                                                | 16                                                                                | 22                                                                                | 445                                                                                | 2214                                                                                | 28                                                                                  | 119                                                                                 | 1970                                                                                | 1067                                                                                |
| Arrive On Green              | 0.13                                                                              | 0.00                                                                              | 0.12                                                                              | 0.05                                                                              | 0.05                                                                              | 0.03                                                                              | 0.13                                                                               | 0.62                                                                                | 0.60                                                                                | 0.07                                                                                | 0.56                                                                                | 0.56                                                                                |
| Sat Flow, veh/h              | 3548                                                                              | 0                                                                                 | 3167                                                                              | 992                                                                               | 310                                                                               | 434                                                                               | 3442                                                                               | 3578                                                                                | 46                                                                                  | 1774                                                                                | 3539                                                                                | 1582                                                                                |
| Grp Volume(v), veh/h         | 259                                                                               | 0                                                                                 | 268                                                                               | 28                                                                                | 0                                                                                 | 0                                                                                 | 315                                                                                | 618                                                                                 | 648                                                                                 | 60                                                                                  | 1500                                                                                | 134                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1774                                                                              | 0                                                                                 | 1583                                                                              | 1737                                                                              | 0                                                                                 | 0                                                                                 | 1721                                                                               | 1770                                                                                | 1855                                                                                | 1774                                                                                | 1770                                                                                | 1582                                                                                |
| Q Serve(g_s), s              | 8.1                                                                               | 0.0                                                                               | 8.1                                                                               | 1.8                                                                               | 0.0                                                                               | 0.0                                                                               | 10.3                                                                               | 23.9                                                                                | 24.0                                                                                | 3.8                                                                                 | 38.2                                                                                | 3.5                                                                                 |
| Cycle Q Clear(g_c), s        | 8.1                                                                               | 0.0                                                                               | 8.1                                                                               | 1.8                                                                               | 0.0                                                                               | 0.0                                                                               | 10.3                                                                               | 23.9                                                                                | 24.0                                                                                | 3.8                                                                                 | 38.2                                                                                | 3.5                                                                                 |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.57                                                                              |                                                                                   | 0.25                                                                              | 1.00                                                                               |                                                                                     | 0.02                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 448                                                                               | 0                                                                                 | 782                                                                               | 89                                                                                | 0                                                                                 | 0                                                                                 | 445                                                                                | 1095                                                                                | 1148                                                                                | 119                                                                                 | 1970                                                                                | 1067                                                                                |
| V/C Ratio(X)                 | 0.58                                                                              | 0.00                                                                              | 0.34                                                                              | 0.32                                                                              | 0.00                                                                              | 0.00                                                                              | 0.71                                                                               | 0.56                                                                                | 0.56                                                                                | 0.50                                                                                | 0.76                                                                                | 0.13                                                                                |
| Avail Cap(c_a), veh/h        | 1031                                                                              | 0                                                                                 | 1302                                                                              | 460                                                                               | 0                                                                                 | 0                                                                                 | 1706                                                                               | 2934                                                                                | 3075                                                                                | 227                                                                                 | 4567                                                                                | 2228                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 48.2                                                                              | 0.0                                                                               | 36.3                                                                              | 53.9                                                                              | 0.0                                                                               | 0.0                                                                               | 48.8                                                                               | 13.1                                                                                | 13.1                                                                                | 52.7                                                                                | 20.0                                                                                | 6.8                                                                                 |
| Incr Delay (d2), s/veh       | 0.4                                                                               | 0.0                                                                               | 0.1                                                                               | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 0.8                                                                                | 0.7                                                                                 | 0.6                                                                                 | 1.2                                                                                 | 0.9                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 4.0                                                                               | 0.0                                                                               | 3.6                                                                               | 0.9                                                                               | 0.0                                                                               | 0.0                                                                               | 4.9                                                                                | 11.9                                                                                | 12.4                                                                                | 1.9                                                                                 | 18.8                                                                                | 2.1                                                                                 |
| LnGrp Delay(d),s/veh         | 48.6                                                                              | 0.0                                                                               | 36.4                                                                              | 54.7                                                                              | 0.0                                                                               | 0.0                                                                               | 49.6                                                                               | 13.7                                                                                | 13.7                                                                                | 53.9                                                                                | 20.8                                                                                | 6.9                                                                                 |
| LnGrp LOS                    | D                                                                                 |                                                                                   | D                                                                                 | D                                                                                 |                                                                                   |                                                                                   | D                                                                                  | B                                                                                   | B                                                                                   | D                                                                                   | C                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 527                                                                               |                                                                                   |                                                                                   | 28                                                                                |                                                                                   |                                                                                   | 1581                                                                               |                                                                                     |                                                                                     | 1694                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 42.4                                                                              |                                                                                   |                                                                                   | 54.7                                                                              |                                                                                   |                                                                                   | 20.9                                                                               |                                                                                     |                                                                                     | 20.9                                                                                |                                                                                     |                                                                                     |
| Approach LOS                 | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | C                                                                                  |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 19.1                                                                              | 69.1                                                                              |                                                                                   | 10.0                                                                              | 11.9                                                                              | 76.4                                                                              |                                                                                    | 18.8                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 6.0                                                                               | 6.0                                                                               |                                                                                   | 7.0                                                                               | 6.0                                                                               | 6.0                                                                               |                                                                                    | 7.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 56.0                                                                              | 149.0                                                                             |                                                                                   | 28.0                                                                              | 13.0                                                                              | 192.0                                                                             |                                                                                    | 31.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 12.3                                                                              | 40.2                                                                              |                                                                                   | 3.8                                                                               | 5.8                                                                               | 26.0                                                                              |                                                                                    | 10.1                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.9                                                                               | 23.0                                                                              |                                                                                   | 0.0                                                                               | 0.0                                                                               | 12.5                                                                              |                                                                                    | 1.6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          | 24.1                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 8: Honoapiilani Highway & Leialii Parkway

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |                                                                                     |
| Traffic Volume (veh/h)       | 5                                                                                 | 0                                                                                 | 5                                                                                 | 135                                                                               | 5                                                                                 | 60                                                                                | 5                                                                                   | 1330                                                                                | 90                                                                                  | 90                                                                                  | 1810                                                                                | 10                                                                                  |
| Future Volume (veh/h)        | 5                                                                                 | 0                                                                                 | 5                                                                                 | 135                                                                               | 5                                                                                 | 60                                                                                | 5                                                                                   | 1330                                                                                | 90                                                                                  | 90                                                                                  | 1810                                                                                | 10                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 5                                                                                 | 0                                                                                 | 1                                                                                 | 147                                                                               | 5                                                                                 | 5                                                                                 | 5                                                                                   | 1446                                                                                | 95                                                                                  | 98                                                                                  | 1967                                                                                | 11                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 194                                                                               | 5                                                                                 | 30                                                                                | 234                                                                               | 107                                                                               | 107                                                                               | 11                                                                                  | 2402                                                                                | 157                                                                                 | 124                                                                                 | 2800                                                                                | 16                                                                                  |
| Arrive On Green              | 0.13                                                                              | 0.00                                                                              | 0.12                                                                              | 0.13                                                                              | 0.13                                                                              | 0.12                                                                              | 0.01                                                                                | 0.95                                                                                | 0.94                                                                                | 0.07                                                                                | 0.78                                                                                | 0.77                                                                                |
| Sat Flow, veh/h              | 1140                                                                              | 37                                                                                | 235                                                                               | 1410                                                                              | 856                                                                               | 856                                                                               | 1774                                                                                | 3373                                                                                | 221                                                                                 | 1774                                                                                | 3609                                                                                | 20                                                                                  |
| Grp Volume(v), veh/h         | 6                                                                                 | 0                                                                                 | 0                                                                                 | 147                                                                               | 0                                                                                 | 10                                                                                | 5                                                                                   | 756                                                                                 | 785                                                                                 | 98                                                                                  | 964                                                                                 | 1014                                                                                |
| Grp Sat Flow(s),veh/h/ln     | 1412                                                                              | 0                                                                                 | 0                                                                                 | 1410                                                                              | 0                                                                                 | 1712                                                                              | 1774                                                                                | 1770                                                                                | 1824                                                                                | 1774                                                                                | 1770                                                                                | 1859                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 12.4                                                                              | 0.0                                                                               | 0.7                                                                               | 0.4                                                                                 | 6.8                                                                                 | 7.0                                                                                 | 7.1                                                                                 | 34.8                                                                                | 35.0                                                                                |
| Cycle Q Clear(g_c), s        | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 13.0                                                                              | 0.0                                                                               | 0.7                                                                               | 0.4                                                                                 | 6.8                                                                                 | 7.0                                                                                 | 7.1                                                                                 | 34.8                                                                                | 35.0                                                                                |
| Prop In Lane                 | 0.83                                                                              |                                                                                   | 0.17                                                                              | 1.00                                                                              |                                                                                   | 0.50                                                                              | 1.00                                                                                |                                                                                     | 0.12                                                                                | 1.00                                                                                |                                                                                     | 0.01                                                                                |
| Lane Grp Cap(c), veh/h       | 228                                                                               | 0                                                                                 | 0                                                                                 | 234                                                                               | 0                                                                                 | 215                                                                               | 11                                                                                  | 1260                                                                                | 1299                                                                                | 124                                                                                 | 1373                                                                                | 1443                                                                                |
| V/C Ratio(X)                 | 0.03                                                                              | 0.00                                                                              | 0.00                                                                              | 0.63                                                                              | 0.00                                                                              | 0.05                                                                              | 0.44                                                                                | 0.60                                                                                | 0.60                                                                                | 0.79                                                                                | 0.70                                                                                | 0.70                                                                                |
| Avail Cap(c_a), veh/h        | 312                                                                               | 0                                                                                 | 0                                                                                 | 318                                                                               | 0                                                                                 | 316                                                                               | 150                                                                                 | 1260                                                                                | 1299                                                                                | 150                                                                                 | 1373                                                                                | 1443                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.33                                                                                | 1.33                                                                                | 1.33                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.83                                                                                | 0.83                                                                                | 0.83                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 50.0                                                                              | 0.0                                                                               | 0.0                                                                               | 55.3                                                                              | 0.0                                                                               | 50.2                                                                              | 64.2                                                                                | 1.2                                                                                 | 1.2                                                                                 | 59.5                                                                                | 7.2                                                                                 | 7.2                                                                                 |
| Incr Delay (d2), s/veh       | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 2.8                                                                               | 0.0                                                                               | 0.1                                                                               | 8.2                                                                                 | 1.8                                                                                 | 1.7                                                                                 | 16.7                                                                                | 3.0                                                                                 | 2.9                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 5.3                                                                               | 0.0                                                                               | 0.3                                                                               | 0.2                                                                                 | 3.3                                                                                 | 3.8                                                                                 | 4.1                                                                                 | 17.7                                                                                | 18.9                                                                                |
| LnGrp Delay(d),s/veh         | 50.0                                                                              | 0.0                                                                               | 0.0                                                                               | 58.1                                                                              | 0.0                                                                               | 50.3                                                                              | 72.4                                                                                | 2.9                                                                                 | 2.9                                                                                 | 76.2                                                                                | 10.2                                                                                | 10.1                                                                                |
| LnGrp LOS                    | D                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   | D                                                                                 | E                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 6                                                                                 |                                                                                   |                                                                                   | 157                                                                               |                                                                                   |                                                                                     | 1546                                                                                |                                                                                     |                                                                                     | 2076                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 50.0                                                                              |                                                                                   |                                                                                   | 57.6                                                                              |                                                                                   |                                                                                     | 3.2                                                                                 |                                                                                     |                                                                                     | 13.3                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 4.8                                                                               | 104.9                                                                             |                                                                                   | 20.3                                                                              | 13.1                                                                              | 96.6                                                                              |                                                                                     | 20.3                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 11.0                                                                              | 82.0                                                                              |                                                                                   | 23.0                                                                              | 11.0                                                                              | 82.0                                                                              |                                                                                     | 23.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.4                                                                               | 37.0                                                                              |                                                                                   | 15.0                                                                              | 9.1                                                                               | 9.0                                                                               |                                                                                     | 2.7                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 34.6                                                                              |                                                                                   | 0.3                                                                               | 0.0                                                                               | 30.2                                                                              |                                                                                     | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   |                                                                                   | 11.0                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 9: Honoapiilani Highway & Front Street/Flemming Road

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |                                                                                   |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 135                                                                               | 5                                                                                 | 15                                                                                | 65                                                                                | 5                                                                                 | 15                                                                                | 15                                                                                  | 1275                                                                                | 15                                                                                  | 10                                                                                  | 1595                                                                                | 260                                                                                 |
| Future Volume (veh/h)        | 135                                                                               | 5                                                                                 | 15                                                                                | 65                                                                                | 5                                                                                 | 15                                                                                | 15                                                                                  | 1275                                                                                | 15                                                                                  | 10                                                                                  | 1595                                                                                | 260                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 147                                                                               | 5                                                                                 | 13                                                                                | 71                                                                                | 5                                                                                 | 9                                                                                 | 16                                                                                  | 1386                                                                                | 15                                                                                  | 11                                                                                  | 1734                                                                                | 207                                                                                 |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 0                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 228                                                                               | 6                                                                                 | 16                                                                                | 226                                                                               | 17                                                                                | 23                                                                                | 19                                                                                  | 2757                                                                                | 30                                                                                  | 13                                                                                  | 2709                                                                                | 1211                                                                                |
| Arrive On Green              | 0.13                                                                              | 0.13                                                                              | 0.12                                                                              | 0.13                                                                              | 0.13                                                                              | 0.12                                                                              | 0.01                                                                                | 0.52                                                                                | 0.51                                                                                | 0.01                                                                                | 0.77                                                                                | 0.77                                                                                |
| Sat Flow, veh/h              | 1339                                                                              | 46                                                                                | 118                                                                               | 1336                                                                              | 132                                                                               | 174                                                                               | 1774                                                                                | 3587                                                                                | 39                                                                                  | 1774                                                                                | 3539                                                                                | 1582                                                                                |
| Grp Volume(v), veh/h         | 165                                                                               | 0                                                                                 | 0                                                                                 | 85                                                                                | 0                                                                                 | 0                                                                                 | 16                                                                                  | 684                                                                                 | 717                                                                                 | 11                                                                                  | 1734                                                                                | 207                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1503                                                                              | 0                                                                                 | 0                                                                                 | 1642                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1856                                                                                | 1774                                                                                | 1770                                                                                | 1582                                                                                |
| Q Serve(g_s), s              | 7.8                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 1.2                                                                                 | 32.9                                                                                | 32.9                                                                                | 0.8                                                                                 | 29.3                                                                                | 4.6                                                                                 |
| Cycle Q Clear(g_c), s        | 13.7                                                                              | 0.0                                                                               | 0.0                                                                               | 5.9                                                                               | 0.0                                                                               | 0.0                                                                               | 1.2                                                                                 | 32.9                                                                                | 32.9                                                                                | 0.8                                                                                 | 29.3                                                                                | 4.6                                                                                 |
| Prop In Lane                 | 0.89                                                                              |                                                                                   | 0.08                                                                              | 0.84                                                                              |                                                                                   | 0.11                                                                              | 1.00                                                                                |                                                                                     | 0.02                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 250                                                                               | 0                                                                                 | 0                                                                                 | 267                                                                               | 0                                                                                 | 0                                                                                 | 19                                                                                  | 1360                                                                                | 1427                                                                                | 13                                                                                  | 2709                                                                                | 1211                                                                                |
| V/C Ratio(X)                 | 0.66                                                                              | 0.00                                                                              | 0.00                                                                              | 0.32                                                                              | 0.00                                                                              | 0.00                                                                              | 0.84                                                                                | 0.50                                                                                | 0.50                                                                                | 0.82                                                                                | 0.64                                                                                | 0.17                                                                                |
| Avail Cap(c_a), veh/h        | 347                                                                               | 0                                                                                 | 0                                                                                 | 365                                                                               | 0                                                                                 | 0                                                                                 | 109                                                                                 | 1360                                                                                | 1427                                                                                | 109                                                                                 | 2709                                                                                | 1211                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.67                                                                                | 0.67                                                                                | 0.67                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.77                                                                                | 0.77                                                                                | 0.77                                                                                | 0.62                                                                                | 0.62                                                                                | 0.62                                                                                |
| Uniform Delay (d), s/veh     | 54.8                                                                              | 0.0                                                                               | 0.0                                                                               | 51.7                                                                              | 0.0                                                                               | 0.0                                                                               | 64.4                                                                                | 15.3                                                                                | 15.3                                                                                | 64.4                                                                                | 7.0                                                                                 | 4.1                                                                                 |
| Incr Delay (d2), s/veh       | 3.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 23.5                                                                                | 1.0                                                                                 | 1.0                                                                                 | 23.6                                                                                | 0.7                                                                                 | 0.2                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 6.0                                                                               | 0.0                                                                               | 0.0                                                                               | 2.8                                                                               | 0.0                                                                               | 0.0                                                                               | 0.7                                                                                 | 16.4                                                                                | 17.2                                                                                | 0.5                                                                                 | 14.2                                                                                | 2.0                                                                                 |
| LnGrp Delay(d),s/veh         | 57.7                                                                              | 0.0                                                                               | 0.0                                                                               | 52.3                                                                              | 0.0                                                                               | 0.0                                                                               | 87.9                                                                                | 16.3                                                                                | 16.3                                                                                | 88.0                                                                                | 7.7                                                                                 | 4.3                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | F                                                                                   | B                                                                                   | B                                                                                   | F                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 165                                                                               |                                                                                   |                                                                                   | 85                                                                                |                                                                                   |                                                                                     | 1417                                                                                |                                                                                     |                                                                                     | 1952                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 57.7                                                                              |                                                                                   |                                                                                   | 52.3                                                                              |                                                                                   |                                                                                     | 17.1                                                                                |                                                                                     |                                                                                     | 7.8                                                                                 |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.4                                                                               | 103.5                                                                             |                                                                                   | 21.1                                                                              | 5.0                                                                               | 103.9                                                                             |                                                                                     | 21.1                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 8.0                                                                               | 83.0                                                                              |                                                                                   | 25.0                                                                              | 8.0                                                                               | 83.0                                                                              |                                                                                     | 25.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 3.2                                                                               | 31.3                                                                              |                                                                                   | 7.9                                                                               | 2.8                                                                               | 34.9                                                                              |                                                                                     | 15.7                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 42.2                                                                              |                                                                                   | 0.2                                                                               | 0.0                                                                               | 28.5                                                                              |                                                                                     | 0.4                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   |                                                                                   | 14.8                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 10: Honoapiilani Highway & Kapunakea Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |                                                                                     |  |  |                                                                                     |
| Traffic Volume (veh/h)       | 190                                                                               | 20                                                                                | 50                                                                                | 90                                                                                | 20                                                                                | 20                                                                                | 60                                                                                 | 1305                                                                                | 60                                                                                  | 15                                                                                  | 1605                                                                                | 130                                                                                 |
| Future Volume (veh/h)        | 190                                                                               | 20                                                                                | 50                                                                                | 90                                                                                | 20                                                                                | 20                                                                                | 60                                                                                 | 1305                                                                                | 60                                                                                  | 15                                                                                  | 1605                                                                                | 130                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 0.99                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 207                                                                               | 22                                                                                | 11                                                                                | 98                                                                                | 22                                                                                | 2                                                                                 | 65                                                                                 | 1418                                                                                | 63                                                                                  | 16                                                                                  | 1745                                                                                | 137                                                                                 |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 286                                                                               | 25                                                                                | 305                                                                               | 373                                                                               | 326                                                                               | 30                                                                                | 83                                                                                 | 2428                                                                                | 108                                                                                 | 19                                                                                  | 2221                                                                                | 172                                                                                 |
| Arrive On Green              | 0.19                                                                              | 0.19                                                                              | 0.19                                                                              | 0.19                                                                              | 0.19                                                                              | 0.19                                                                              | 0.06                                                                               | 0.94                                                                                | 0.93                                                                                | 0.02                                                                                | 1.00                                                                                | 1.00                                                                                |
| Sat Flow, veh/h              | 1205                                                                              | 128                                                                               | 1576                                                                              | 1380                                                                              | 1682                                                                              | 153                                                                               | 1774                                                                               | 3451                                                                                | 153                                                                                 | 1774                                                                                | 3328                                                                                | 258                                                                                 |
| Grp Volume(v), veh/h         | 229                                                                               | 0                                                                                 | 11                                                                                | 98                                                                                | 0                                                                                 | 24                                                                                | 65                                                                                 | 726                                                                                 | 755                                                                                 | 16                                                                                  | 918                                                                                 | 964                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1333                                                                              | 0                                                                                 | 1576                                                                              | 1380                                                                              | 0                                                                                 | 1835                                                                              | 1774                                                                               | 1770                                                                                | 1835                                                                                | 1774                                                                                | 1770                                                                                | 1817                                                                                |
| Q Serve(g_s), s              | 20.6                                                                              | 0.0                                                                               | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 1.4                                                                               | 4.7                                                                                | 7.6                                                                                 | 7.7                                                                                 | 1.2                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Cycle Q Clear(g_c), s        | 22.0                                                                              | 0.0                                                                               | 0.7                                                                               | 6.5                                                                               | 0.0                                                                               | 1.4                                                                               | 4.7                                                                                | 7.6                                                                                 | 7.7                                                                                 | 1.2                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Prop In Lane                 | 0.90                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                               |                                                                                     | 0.08                                                                                | 1.00                                                                                |                                                                                     | 0.14                                                                                |
| Lane Grp Cap(c), veh/h       | 311                                                                               | 0                                                                                 | 305                                                                               | 373                                                                               | 0                                                                                 | 355                                                                               | 83                                                                                 | 1245                                                                                | 1291                                                                                | 19                                                                                  | 1181                                                                                | 1213                                                                                |
| V/C Ratio(X)                 | 0.74                                                                              | 0.00                                                                              | 0.04                                                                              | 0.26                                                                              | 0.00                                                                              | 0.07                                                                              | 0.79                                                                               | 0.58                                                                                | 0.59                                                                                | 0.84                                                                                | 0.78                                                                                | 0.79                                                                                |
| Avail Cap(c_a), veh/h        | 331                                                                               | 0                                                                                 | 327                                                                               | 393                                                                               | 0                                                                                 | 381                                                                               | 109                                                                                | 1245                                                                                | 1291                                                                                | 109                                                                                 | 1181                                                                                | 1213                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.33                                                                               | 1.33                                                                                | 1.33                                                                                | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.64                                                                               | 0.64                                                                                | 0.64                                                                                | 0.70                                                                                | 0.70                                                                                | 0.70                                                                                |
| Uniform Delay (d), s/veh     | 51.8                                                                              | 0.0                                                                               | 42.6                                                                              | 44.9                                                                              | 0.0                                                                               | 42.9                                                                              | 60.3                                                                               | 1.5                                                                                 | 1.5                                                                                 | 63.5                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Incr Delay (d2), s/veh       | 7.9                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.1                                                                               | 11.6                                                                               | 1.3                                                                                 | 1.2                                                                                 | 21.7                                                                                | 3.6                                                                                 | 3.8                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 8.7                                                                               | 0.0                                                                               | 0.3                                                                               | 3.1                                                                               | 0.0                                                                               | 0.7                                                                               | 2.6                                                                                | 3.6                                                                                 | 4.0                                                                                 | 0.7                                                                                 | 1.2                                                                                 | 1.3                                                                                 |
| LnGrp Delay(d),s/veh         | 59.7                                                                              | 0.0                                                                               | 42.6                                                                              | 45.3                                                                              | 0.0                                                                               | 42.9                                                                              | 71.9                                                                               | 2.8                                                                                 | 2.8                                                                                 | 85.2                                                                                | 3.6                                                                                 | 3.8                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 |                                                                                   | D                                                                                 | E                                                                                  | A                                                                                   | A                                                                                   | F                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 240                                                                               |                                                                                   |                                                                                   | 122                                                                               |                                                                                   |                                                                                    | 1546                                                                                |                                                                                     |                                                                                     | 1898                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 58.9                                                                              |                                                                                   |                                                                                   | 44.8                                                                              |                                                                                   |                                                                                    | 5.7                                                                                 |                                                                                     |                                                                                     | 4.4                                                                                 |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                    | A                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 10.1                                                                              | 90.8                                                                              |                                                                                   | 29.2                                                                              | 5.4                                                                               | 95.4                                                                              |                                                                                    | 29.2                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 8.0                                                                               | 82.0                                                                              |                                                                                   | 26.0                                                                              | 8.0                                                                               | 82.0                                                                              |                                                                                    | 26.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 6.7                                                                               | 2.0                                                                               |                                                                                   | 8.5                                                                               | 3.2                                                                               | 9.7                                                                               |                                                                                    | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 47.6                                                                              |                                                                                   | 0.4                                                                               | 0.0                                                                               | 27.7                                                                              |                                                                                    | 0.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 9.7                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Notes</b>                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 11: Honoapiilani Highway & Keawe Street

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 60                                                                                | 150                                                                               | 90                                                                                | 145                                                                               | 130                                                                               | 650                                                                               | 80                                                                                  | 715                                                                                 | 195                                                                                 | 570                                                                                 | 950                                                                                 | 100                                                                                 |
| Future Volume (veh/h)        | 60                                                                                | 150                                                                               | 90                                                                                | 145                                                                               | 130                                                                               | 650                                                                               | 80                                                                                  | 715                                                                                 | 195                                                                                 | 570                                                                                 | 950                                                                                 | 100                                                                                 |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                                |                                                                                     | 0.99                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 65                                                                                | 163                                                                               | 10                                                                                | 158                                                                               | 141                                                                               | 317                                                                               | 87                                                                                  | 777                                                                                 | 127                                                                                 | 620                                                                                 | 1033                                                                                | 104                                                                                 |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   | 2                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 100                                                                               | 195                                                                               | 266                                                                               | 253                                                                               | 560                                                                               | 463                                                                               | 110                                                                                 | 1423                                                                                | 628                                                                                 | 706                                                                                 | 1771                                                                                | 178                                                                                 |
| Arrive On Green              | 0.18                                                                              | 0.18                                                                              | 0.18                                                                              | 0.09                                                                              | 0.30                                                                              | 0.30                                                                              | 0.06                                                                                | 0.40                                                                                | 0.40                                                                                | 0.07                                                                                | 0.18                                                                                | 0.18                                                                                |
| Sat Flow, veh/h              | 367                                                                               | 1109                                                                              | 1511                                                                              | 1774                                                                              | 1863                                                                              | 1541                                                                              | 1774                                                                                | 3539                                                                                | 1562                                                                                | 3442                                                                                | 3247                                                                                | 327                                                                                 |
| Grp Volume(v), veh/h         | 228                                                                               | 0                                                                                 | 10                                                                                | 158                                                                               | 141                                                                               | 317                                                                               | 87                                                                                  | 777                                                                                 | 127                                                                                 | 620                                                                                 | 563                                                                                 | 574                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1476                                                                              | 0                                                                                 | 1511                                                                              | 1774                                                                              | 1863                                                                              | 1541                                                                              | 1774                                                                                | 1770                                                                                | 1562                                                                                | 1721                                                                                | 1770                                                                                | 1805                                                                                |
| Q Serve(g_s), s              | 17.1                                                                              | 0.0                                                                               | 0.7                                                                               | 9.1                                                                               | 7.4                                                                               | 23.6                                                                              | 6.3                                                                                 | 21.9                                                                                | 6.9                                                                                 | 23.2                                                                                | 37.9                                                                                | 37.9                                                                                |
| Cycle Q Clear(g_c), s        | 19.4                                                                              | 0.0                                                                               | 0.7                                                                               | 9.1                                                                               | 7.4                                                                               | 23.6                                                                              | 6.3                                                                                 | 21.9                                                                                | 6.9                                                                                 | 23.2                                                                                | 37.9                                                                                | 37.9                                                                                |
| Prop In Lane                 | 0.29                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 0.18                                                                                |
| Lane Grp Cap(c), veh/h       | 296                                                                               | 0                                                                                 | 266                                                                               | 253                                                                               | 560                                                                               | 463                                                                               | 110                                                                                 | 1423                                                                                | 628                                                                                 | 706                                                                                 | 965                                                                                 | 984                                                                                 |
| V/C Ratio(X)                 | 0.77                                                                              | 0.00                                                                              | 0.04                                                                              | 0.62                                                                              | 0.25                                                                              | 0.68                                                                              | 0.79                                                                                | 0.55                                                                                | 0.20                                                                                | 0.88                                                                                | 0.58                                                                                | 0.58                                                                                |
| Avail Cap(c_a), veh/h        | 330                                                                               | 0                                                                                 | 302                                                                               | 279                                                                               | 630                                                                               | 521                                                                               | 328                                                                                 | 1423                                                                                | 628                                                                                 | 953                                                                                 | 965                                                                                 | 984                                                                                 |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 0.33                                                                                | 0.33                                                                                | 0.33                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.79                                                                                | 0.79                                                                                | 0.79                                                                                | 0.52                                                                                | 0.52                                                                                | 0.52                                                                                |
| Uniform Delay (d), s/veh     | 51.8                                                                              | 0.0                                                                               | 44.4                                                                              | 38.5                                                                              | 34.4                                                                              | 40.0                                                                              | 60.2                                                                                | 29.8                                                                                | 25.3                                                                                | 59.0                                                                                | 39.8                                                                                | 39.8                                                                                |
| Incr Delay (d2), s/veh       | 9.7                                                                               | 0.0                                                                               | 0.1                                                                               | 3.7                                                                               | 0.2                                                                               | 3.2                                                                               | 3.8                                                                                 | 1.2                                                                                 | 0.6                                                                                 | 3.2                                                                                 | 1.3                                                                                 | 1.3                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 8.8                                                                               | 0.0                                                                               | 0.3                                                                               | 4.6                                                                               | 3.9                                                                               | 10.4                                                                              | 3.2                                                                                 | 10.9                                                                                | 3.1                                                                                 | 11.4                                                                                | 19.0                                                                                | 19.4                                                                                |
| LnGrp Delay(d),s/veh         | 61.5                                                                              | 0.0                                                                               | 44.5                                                                              | 42.2                                                                              | 34.6                                                                              | 43.2                                                                              | 64.0                                                                                | 31.0                                                                                | 25.9                                                                                | 62.2                                                                                | 41.1                                                                                | 41.1                                                                                |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 | C                                                                                 | D                                                                                 | E                                                                                   | C                                                                                   | C                                                                                   | E                                                                                   | D                                                                                   | D                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 238                                                                               |                                                                                   |                                                                                   | 616                                                                               |                                                                                   |                                                                                     | 991                                                                                 |                                                                                     |                                                                                     | 1757                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 60.8                                                                              |                                                                                   |                                                                                   | 41.0                                                                              |                                                                                   |                                                                                     | 33.2                                                                                |                                                                                     |                                                                                     | 48.6                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                     | C                                                                                   |                                                                                     |                                                                                     | D                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 12.0                                                                              | 74.9                                                                              | 16.1                                                                              | 26.9                                                                              | 30.7                                                                              | 56.3                                                                              |                                                                                     | 43.1                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 24.0                                                                              | 49.0                                                                              | 13.0                                                                              | 25.0                                                                              | 36.0                                                                              | 37.0                                                                              |                                                                                     | 43.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 8.3                                                                               | 39.9                                                                              | 11.1                                                                              | 21.4                                                                              | 25.2                                                                              | 23.9                                                                              |                                                                                     | 25.6                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.1                                                                               | 5.9                                                                               | 0.1                                                                               | 0.3                                                                               | 1.4                                                                               | 6.5                                                                               |                                                                                     | 2.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 43.9                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



---

## **APPENDIX C**

### **LEVEL OF SERVICE CALCULATIONS**

- Base Year 2027 AM Peak
-

# HCM 2010 Signalized Intersection Summary

## 1: Honoapiilani Highway & Napilihau Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 50                                                                                | 45                                                                                | 295                                                                               | 90                                                                                | 50                                                                                | 20                                                                                | 220                                                                                | 255                                                                                 | 100                                                                                 | 10                                                                                  | 205                                                                                 | 30                                                                                  |
| Future Volume (veh/h)        | 50                                                                                | 45                                                                                | 295                                                                               | 90                                                                                | 50                                                                                | 20                                                                                | 220                                                                                | 255                                                                                 | 100                                                                                 | 10                                                                                  | 205                                                                                 | 30                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                  | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.99                                                                              | 0.99                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 54                                                                                | 49                                                                                | 38                                                                                | 98                                                                                | 54                                                                                | 10                                                                                | 239                                                                                | 277                                                                                 | 54                                                                                  | 11                                                                                  | 223                                                                                 | 9                                                                                   |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 239                                                                               | 164                                                                               | 257                                                                               | 328                                                                               | 250                                                                               | 46                                                                                | 320                                                                                | 790                                                                                 | 671                                                                                 | 15                                                                                  | 470                                                                                 | 399                                                                                 |
| Arrive On Green              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.18                                                                               | 0.42                                                                                | 0.42                                                                                | 0.01                                                                                | 0.25                                                                                | 0.25                                                                                |
| Sat Flow, veh/h              | 614                                                                               | 998                                                                               | 1569                                                                              | 1296                                                                              | 1527                                                                              | 283                                                                               | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 103                                                                               | 0                                                                                 | 38                                                                                | 98                                                                                | 0                                                                                 | 64                                                                                | 239                                                                                | 277                                                                                 | 54                                                                                  | 11                                                                                  | 223                                                                                 | 9                                                                                   |
| Grp Sat Flow(s),veh/h/ln     | 1612                                                                              | 0                                                                                 | 1569                                                                              | 1296                                                                              | 0                                                                                 | 1810                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 0.5                                                                               | 0.0                                                                               | 0.8                                                                               | 2.9                                                                               | 0.0                                                                               | 1.2                                                                               | 5.1                                                                                | 4.0                                                                                 | 0.8                                                                                 | 0.2                                                                                 | 4.0                                                                                 | 0.2                                                                                 |
| Cycle Q Clear(g_c), s        | 2.0                                                                               | 0.0                                                                               | 0.8                                                                               | 4.9                                                                               | 0.0                                                                               | 1.2                                                                               | 5.1                                                                                | 4.0                                                                                 | 0.8                                                                                 | 0.2                                                                                 | 4.0                                                                                 | 0.2                                                                                 |
| Prop In Lane                 | 0.52                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.16                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 403                                                                               | 0                                                                                 | 257                                                                               | 328                                                                               | 0                                                                                 | 297                                                                               | 320                                                                                | 790                                                                                 | 671                                                                                 | 15                                                                                  | 470                                                                                 | 399                                                                                 |
| V/C Ratio(X)                 | 0.26                                                                              | 0.00                                                                              | 0.15                                                                              | 0.30                                                                              | 0.00                                                                              | 0.22                                                                              | 0.75                                                                               | 0.35                                                                                | 0.08                                                                                | 0.72                                                                                | 0.47                                                                                | 0.02                                                                                |
| Avail Cap(c_a), veh/h        | 1079                                                                              | 0                                                                                 | 949                                                                               | 899                                                                               | 0                                                                                 | 1095                                                                              | 1342                                                                               | 3710                                                                                | 3153                                                                                | 671                                                                                 | 3005                                                                                | 2555                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 14.7                                                                              | 0.0                                                                               | 14.2                                                                              | 16.9                                                                              | 0.0                                                                               | 14.4                                                                              | 15.4                                                                               | 7.7                                                                                 | 6.8                                                                                 | 19.6                                                                                | 12.6                                                                                | 11.2                                                                                |
| Incr Delay (d2), s/veh       | 0.3                                                                               | 0.0                                                                               | 0.3                                                                               | 0.5                                                                               | 0.0                                                                               | 0.4                                                                               | 3.5                                                                                | 0.6                                                                                 | 0.1                                                                                 | 47.2                                                                                | 1.6                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.0                                                                               | 0.0                                                                               | 0.4                                                                               | 1.1                                                                               | 0.0                                                                               | 0.6                                                                               | 2.8                                                                                | 2.1                                                                                 | 0.4                                                                                 | 0.3                                                                                 | 2.3                                                                                 | 0.1                                                                                 |
| LnGrp Delay(d),s/veh         | 15.0                                                                              | 0.0                                                                               | 14.5                                                                              | 17.4                                                                              | 0.0                                                                               | 14.7                                                                              | 18.9                                                                               | 8.3                                                                                 | 6.9                                                                                 | 66.8                                                                                | 14.2                                                                                | 11.2                                                                                |
| LnGrp LOS                    | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                  | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 141                                                                               |                                                                                   |                                                                                   | 162                                                                               |                                                                                   |                                                                                    | 570                                                                                 |                                                                                     |                                                                                     | 243                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 14.9                                                                              |                                                                                   |                                                                                   | 16.3                                                                              |                                                                                   |                                                                                    | 12.6                                                                                |                                                                                     |                                                                                     | 16.5                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.3                                                                               | 22.8                                                                              |                                                                                   | 11.5                                                                              | 12.2                                                                              | 16.0                                                                              |                                                                                    | 11.5                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 79.0                                                                              |                                                                                   | 24.0                                                                              | 30.0                                                                              | 64.0                                                                              |                                                                                    | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.2                                                                               | 6.0                                                                               |                                                                                   | 4.0                                                                               | 7.1                                                                               | 6.0                                                                               |                                                                                    | 6.9                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 4.1                                                                               |                                                                                   | 0.6                                                                               | 0.7                                                                               | 2.9                                                                               |                                                                                    | 0.5                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 14.3                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## HCM 2010 Signalized Intersection Summary

### 2: Honoapiilani Highway & Hoohui Road

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 60                                                                                | 5                                                                                 | 180                                                                               | 90                                                                                | 20                                                                                | 15                                                                                | 135                                                                                 | 550                                                                                 | 15                                                                                  | 10                                                                                  | 590                                                                                 | 65                                                                                  |
| Future Volume (veh/h)        | 60                                                                                | 5                                                                                 | 180                                                                               | 90                                                                                | 20                                                                                | 15                                                                                | 135                                                                                 | 550                                                                                 | 15                                                                                  | 10                                                                                  | 590                                                                                 | 65                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                              |                                                                                   | 0.97                                                                              | 0.98                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 0.99                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 65                                                                                | 5                                                                                 | 19                                                                                | 98                                                                                | 22                                                                                | 2                                                                                 | 147                                                                                 | 598                                                                                 | 0                                                                                   | 11                                                                                  | 641                                                                                 | 30                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 364                                                                               | 24                                                                                | 303                                                                               | 329                                                                               | 330                                                                               | 30                                                                                | 377                                                                                 | 936                                                                                 | 796                                                                                 | 364                                                                                 | 796                                                                                 | 672                                                                                 |
| Arrive On Green              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.08                                                                                | 0.50                                                                                | 0.00                                                                                | 0.01                                                                                | 0.43                                                                                | 0.43                                                                                |
| Sat Flow, veh/h              | 1208                                                                              | 120                                                                               | 1543                                                                              | 1352                                                                              | 1679                                                                              | 153                                                                               | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1572                                                                                |
| Grp Volume(v), veh/h         | 70                                                                                | 0                                                                                 | 19                                                                                | 98                                                                                | 0                                                                                 | 24                                                                                | 147                                                                                 | 598                                                                                 | 0                                                                                   | 11                                                                                  | 641                                                                                 | 30                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1327                                                                              | 0                                                                                 | 1543                                                                              | 1352                                                                              | 0                                                                                 | 1831                                                                              | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1572                                                                                |
| Q Serve(g_s), s              | 2.2                                                                               | 0.0                                                                               | 0.5                                                                               | 3.7                                                                               | 0.0                                                                               | 0.6                                                                               | 2.3                                                                                 | 12.9                                                                                | 0.0                                                                                 | 0.2                                                                                 | 16.4                                                                                | 0.6                                                                                 |
| Cycle Q Clear(g_c), s        | 2.8                                                                               | 0.0                                                                               | 0.5                                                                               | 6.4                                                                               | 0.0                                                                               | 0.6                                                                               | 2.3                                                                                 | 12.9                                                                                | 0.0                                                                                 | 0.2                                                                                 | 16.4                                                                                | 0.6                                                                                 |
| Prop In Lane                 | 0.93                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 388                                                                               | 0                                                                                 | 303                                                                               | 329                                                                               | 0                                                                                 | 360                                                                               | 377                                                                                 | 936                                                                                 | 796                                                                                 | 364                                                                                 | 796                                                                                 | 672                                                                                 |
| V/C Ratio(X)                 | 0.18                                                                              | 0.00                                                                              | 0.06                                                                              | 0.30                                                                              | 0.00                                                                              | 0.07                                                                              | 0.39                                                                                | 0.64                                                                                | 0.00                                                                                | 0.03                                                                                | 0.81                                                                                | 0.04                                                                                |
| Avail Cap(c_a), veh/h        | 746                                                                               | 0                                                                                 | 705                                                                               | 681                                                                               | 0                                                                                 | 837                                                                               | 715                                                                                 | 1737                                                                                | 1476                                                                                | 836                                                                                 | 1737                                                                                | 1466                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 0.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 18.9                                                                              | 0.0                                                                               | 17.9                                                                              | 21.5                                                                              | 0.0                                                                               | 17.9                                                                              | 10.0                                                                                | 10.0                                                                                | 0.0                                                                                 | 9.5                                                                                 | 13.7                                                                                | 9.1                                                                                 |
| Incr Delay (d2), s/veh       | 0.2                                                                               | 0.0                                                                               | 0.1                                                                               | 0.5                                                                               | 0.0                                                                               | 0.1                                                                               | 0.7                                                                                 | 0.7                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 2.0                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.9                                                                               | 0.0                                                                               | 0.2                                                                               | 1.4                                                                               | 0.0                                                                               | 0.3                                                                               | 1.2                                                                                 | 6.7                                                                                 | 0.0                                                                                 | 0.1                                                                                 | 8.8                                                                                 | 0.3                                                                                 |
| LnGrp Delay(d),s/veh         | 19.1                                                                              | 0.0                                                                               | 18.0                                                                              | 22.0                                                                              | 0.0                                                                               | 18.0                                                                              | 10.7                                                                                | 10.7                                                                                | 0.0                                                                                 | 9.5                                                                                 | 15.7                                                                                | 9.2                                                                                 |
| LnGrp LOS                    | B                                                                                 |                                                                                   | B                                                                                 | C                                                                                 |                                                                                   | B                                                                                 | B                                                                                   | B                                                                                   |                                                                                     | A                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 89                                                                                |                                                                                   |                                                                                   | 122                                                                               |                                                                                   |                                                                                     | 745                                                                                 |                                                                                     |                                                                                     | 682                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 18.9                                                                              |                                                                                   |                                                                                   | 21.2                                                                              |                                                                                   |                                                                                     | 10.7                                                                                |                                                                                     |                                                                                     | 15.3                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.5                                                                               | 33.5                                                                              |                                                                                   | 15.8                                                                              | 9.6                                                                               | 29.4                                                                              |                                                                                     | 15.8                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 51.0                                                                              |                                                                                   | 25.0                                                                              | 15.0                                                                              | 51.0                                                                              |                                                                                     | 25.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.2                                                                               | 14.9                                                                              |                                                                                   | 4.8                                                                               | 4.3                                                                               | 18.4                                                                              |                                                                                     | 8.4                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 4.3                                                                               |                                                                                   | 0.4                                                                               | 0.3                                                                               | 4.8                                                                               |                                                                                     | 0.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 13.8                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 3: Honoapiilani Highway & Akahele Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 40                                                                                | 5                                                                                 | 125                                                                               | 5                                                                                 | 5                                                                                 | 5                                                                                 | 60                                                                                 | 635                                                                                 | 15                                                                                  | 5                                                                                   | 795                                                                                 | 30                                                                                  |
| Future Volume (veh/h)        | 40                                                                                | 5                                                                                 | 125                                                                               | 5                                                                                 | 5                                                                                 | 5                                                                                 | 60                                                                                 | 635                                                                                 | 15                                                                                  | 5                                                                                   | 795                                                                                 | 30                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                  | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 0.99                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 43                                                                                | 5                                                                                 | 8                                                                                 | 5                                                                                 | 5                                                                                 | 1                                                                                 | 65                                                                                 | 690                                                                                 | 11                                                                                  | 5                                                                                   | 864                                                                                 | 19                                                                                  |
| Adj No. of Lanes             | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 58                                                                                | 73                                                                                | 117                                                                               | 9                                                                                 | 162                                                                               | 136                                                                               | 85                                                                                 | 1088                                                                                | 924                                                                                 | 7                                                                                   | 1006                                                                                | 850                                                                                 |
| Arrive On Green              | 0.03                                                                              | 0.11                                                                              | 0.11                                                                              | 0.01                                                                              | 0.09                                                                              | 0.09                                                                              | 0.05                                                                               | 0.58                                                                                | 0.58                                                                                | 0.00                                                                                | 0.54                                                                                | 0.54                                                                                |
| Sat Flow, veh/h              | 1774                                                                              | 640                                                                               | 1025                                                                              | 1774                                                                              | 1863                                                                              | 1562                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1573                                                                                |
| Grp Volume(v), veh/h         | 43                                                                                | 0                                                                                 | 13                                                                                | 5                                                                                 | 5                                                                                 | 1                                                                                 | 65                                                                                 | 690                                                                                 | 11                                                                                  | 5                                                                                   | 864                                                                                 | 19                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1774                                                                              | 0                                                                                 | 1665                                                                              | 1774                                                                              | 1863                                                                              | 1562                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1573                                                                                |
| Q Serve(g_s), s              | 1.6                                                                               | 0.0                                                                               | 0.5                                                                               | 0.2                                                                               | 0.2                                                                               | 0.0                                                                               | 2.5                                                                                | 16.7                                                                                | 0.2                                                                                 | 0.2                                                                                 | 27.2                                                                                | 0.4                                                                                 |
| Cycle Q Clear(g_c), s        | 1.6                                                                               | 0.0                                                                               | 0.5                                                                               | 0.2                                                                               | 0.2                                                                               | 0.0                                                                               | 2.5                                                                                | 16.7                                                                                | 0.2                                                                                 | 0.2                                                                                 | 27.2                                                                                | 0.4                                                                                 |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 0.62                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 58                                                                                | 0                                                                                 | 190                                                                               | 9                                                                                 | 162                                                                               | 136                                                                               | 85                                                                                 | 1088                                                                                | 924                                                                                 | 7                                                                                   | 1006                                                                                | 850                                                                                 |
| V/C Ratio(X)                 | 0.74                                                                              | 0.00                                                                              | 0.07                                                                              | 0.53                                                                              | 0.03                                                                              | 0.01                                                                              | 0.77                                                                               | 0.63                                                                                | 0.01                                                                                | 0.71                                                                                | 0.86                                                                                | 0.02                                                                                |
| Avail Cap(c_a), veh/h        | 519                                                                               | 0                                                                                 | 511                                                                               | 519                                                                               | 572                                                                               | 480                                                                               | 649                                                                                | 1771                                                                                | 1505                                                                                | 649                                                                                 | 1771                                                                                | 1495                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 32.8                                                                              | 0.0                                                                               | 27.0                                                                              | 33.9                                                                              | 28.6                                                                              | 28.5                                                                              | 32.2                                                                               | 9.4                                                                                 | 6.0                                                                                 | 34.0                                                                                | 13.5                                                                                | 7.3                                                                                 |
| Incr Delay (d2), s/veh       | 16.9                                                                              | 0.0                                                                               | 0.1                                                                               | 39.6                                                                              | 0.1                                                                               | 0.0                                                                               | 13.5                                                                               | 0.6                                                                                 | 0.0                                                                                 | 82.5                                                                                | 2.3                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.1                                                                               | 0.0                                                                               | 0.2                                                                               | 0.2                                                                               | 0.1                                                                               | 0.0                                                                               | 1.5                                                                                | 8.6                                                                                 | 0.1                                                                                 | 0.3                                                                                 | 14.3                                                                                | 0.2                                                                                 |
| LnGrp Delay(d),s/veh         | 49.7                                                                              | 0.0                                                                               | 27.2                                                                              | 73.5                                                                              | 28.7                                                                              | 28.5                                                                              | 45.7                                                                               | 10.0                                                                                | 6.0                                                                                 | 116.5                                                                               | 15.8                                                                                | 7.3                                                                                 |
| LnGrp LOS                    | D                                                                                 |                                                                                   | C                                                                                 | E                                                                                 | C                                                                                 | C                                                                                 | D                                                                                  | B                                                                                   | A                                                                                   | F                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 56                                                                                |                                                                                   |                                                                                   |                                                                                   | 11                                                                                |                                                                                   | 766                                                                                |                                                                                     |                                                                                     |                                                                                     | 888                                                                                 |                                                                                     |
| Approach Delay, s/veh        | 44.5                                                                              |                                                                                   |                                                                                   |                                                                                   | 49.0                                                                              |                                                                                   | 13.0                                                                               |                                                                                     |                                                                                     |                                                                                     | 16.1                                                                                |                                                                                     |
| Approach LOS                 | D                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                   | B                                                                                  |                                                                                     |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.3                                                                               | 44.9                                                                              | 5.4                                                                               | 12.8                                                                              | 8.3                                                                               | 41.9                                                                              | 7.2                                                                                | 11.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              | 25.0                                                                              | 65.0                                                                              | 20.0                                                                               | 21.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.2                                                                               | 18.7                                                                              | 2.2                                                                               | 2.5                                                                               | 4.5                                                                               | 29.2                                                                              | 3.6                                                                                | 2.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 5.5                                                                               | 0.0                                                                               | 0.0                                                                               | 0.1                                                                               | 7.7                                                                               | 0.1                                                                                | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 15.9                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 4: Honoapiilani Highway & Lower Honoapiilani Road

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 35                                                                                | 10                                                                                | 480                                                                               | 20                                                                                | 5                                                                                 | 0                                                                                 | 315                                                                                 | 695                                                                                 | 45                                                                                  | 10                                                                                  | 890                                                                                 | 10                                                                                  |
| Future Volume (veh/h)        | 35                                                                                | 10                                                                                | 480                                                                               | 20                                                                                | 5                                                                                 | 0                                                                                 | 315                                                                                 | 695                                                                                 | 45                                                                                  | 10                                                                                  | 890                                                                                 | 10                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 1.00                                                                              | 0.99                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 38                                                                                | 11                                                                                | 0                                                                                 | 22                                                                                | 5                                                                                 | 0                                                                                 | 342                                                                                 | 755                                                                                 | 48                                                                                  | 11                                                                                  | 967                                                                                 | 3                                                                                   |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 183                                                                               | 30                                                                                | 113                                                                               | 188                                                                               | 30                                                                                | 0                                                                                 | 406                                                                                 | 2284                                                                                | 145                                                                                 | 15                                                                                  | 1612                                                                                | 721                                                                                 |
| Arrive On Green              | 0.09                                                                              | 0.07                                                                              | 0.00                                                                              | 0.09                                                                              | 0.07                                                                              | 0.00                                                                              | 0.23                                                                                | 0.68                                                                                | 0.68                                                                                | 0.01                                                                                | 0.46                                                                                | 0.46                                                                                |
| Sat Flow, veh/h              | 1111                                                                              | 421                                                                               | 1583                                                                              | 1151                                                                              | 418                                                                               | 0                                                                                 | 1774                                                                                | 3380                                                                                | 215                                                                                 | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 49                                                                                | 0                                                                                 | 0                                                                                 | 27                                                                                | 0                                                                                 | 0                                                                                 | 342                                                                                 | 395                                                                                 | 408                                                                                 | 11                                                                                  | 967                                                                                 | 3                                                                                   |
| Grp Sat Flow(s),veh/h/ln     | 1532                                                                              | 0                                                                                 | 1583                                                                              | 1569                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1825                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 0.9                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 11.3                                                                                | 5.7                                                                                 | 5.7                                                                                 | 0.4                                                                                 | 12.5                                                                                | 0.1                                                                                 |
| Cycle Q Clear(g_c), s        | 1.7                                                                               | 0.0                                                                               | 0.0                                                                               | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 11.3                                                                                | 5.7                                                                                 | 5.7                                                                                 | 0.4                                                                                 | 12.5                                                                                | 0.1                                                                                 |
| Prop In Lane                 | 0.78                                                                              |                                                                                   | 1.00                                                                              | 0.81                                                                              |                                                                                   | 0.00                                                                              | 1.00                                                                                |                                                                                     | 0.12                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 238                                                                               | 0                                                                                 | 113                                                                               | 244                                                                               | 0                                                                                 | 0                                                                                 | 406                                                                                 | 1196                                                                                | 1233                                                                                | 15                                                                                  | 1612                                                                                | 721                                                                                 |
| V/C Ratio(X)                 | 0.21                                                                              | 0.00                                                                              | 0.00                                                                              | 0.11                                                                              | 0.00                                                                              | 0.00                                                                              | 0.84                                                                                | 0.33                                                                                | 0.33                                                                                | 0.74                                                                                | 0.60                                                                                | 0.00                                                                                |
| Avail Cap(c_a), veh/h        | 616                                                                               | 0                                                                                 | 517                                                                               | 735                                                                               | 0                                                                                 | 0                                                                                 | 2055                                                                                | 1993                                                                                | 2055                                                                                | 2055                                                                                | 3985                                                                                | 1783                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 26.8                                                                              | 0.0                                                                               | 0.0                                                                               | 26.4                                                                              | 0.0                                                                               | 0.0                                                                               | 22.6                                                                                | 4.1                                                                                 | 4.1                                                                                 | 30.3                                                                                | 12.5                                                                                | 9.1                                                                                 |
| Incr Delay (d2), s/veh       | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 1.9                                                                                 | 0.3                                                                                 | 0.3                                                                                 | 23.3                                                                                | 0.8                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 5.7                                                                                 | 2.9                                                                                 | 2.9                                                                                 | 0.3                                                                                 | 6.2                                                                                 | 0.0                                                                                 |
| LnGrp Delay(d),s/veh         | 27.2                                                                              | 0.0                                                                               | 0.0                                                                               | 26.6                                                                              | 0.0                                                                               | 0.0                                                                               | 24.4                                                                                | 4.5                                                                                 | 4.5                                                                                 | 53.6                                                                                | 13.3                                                                                | 9.1                                                                                 |
| LnGrp LOS                    | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                   | A                                                                                   | A                                                                                   | D                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 49                                                                                |                                                                                   |                                                                                   | 27                                                                                |                                                                                   |                                                                                     | 1145                                                                                |                                                                                     |                                                                                     | 981                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 27.2                                                                              |                                                                                   |                                                                                   | 26.6                                                                              |                                                                                   |                                                                                     | 10.4                                                                                |                                                                                     |                                                                                     | 13.7                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 18.0                                                                              | 33.9                                                                              |                                                                                   | 9.4                                                                               | 4.5                                                                               | 47.4                                                                              |                                                                                     | 9.4                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 71.0                                                                              | 69.0                                                                              |                                                                                   | 25.0                                                                              | 71.0                                                                              | 69.0                                                                              |                                                                                     | 20.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 13.3                                                                              | 14.5                                                                              |                                                                                   | 2.8                                                                               | 2.4                                                                               | 7.7                                                                               |                                                                                     | 3.7                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.8                                                                               | 13.4                                                                              |                                                                                   | 0.0                                                                               | 0.0                                                                               | 9.3                                                                               |                                                                                     | 0.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 12.5                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 5: Honoapiilani Highway & Kai Malina Parkway/Halawai Drive

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 30                                                                                | 0                                                                                 | 70                                                                                | 10                                                                                | 5                                                                                 | 10                                                                                | 135                                                                                 | 1105                                                                                | 20                                                                                  | 15                                                                                  | 1370                                                                                | 65                                                                                  |
| Future Volume (veh/h)        | 30                                                                                | 0                                                                                 | 70                                                                                | 10                                                                                | 5                                                                                 | 10                                                                                | 135                                                                                 | 1105                                                                                | 20                                                                                  | 15                                                                                  | 1370                                                                                | 65                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 33                                                                                | 0                                                                                 | 1                                                                                 | 11                                                                                | 5                                                                                 | 1                                                                                 | 147                                                                                 | 1201                                                                                | 21                                                                                  | 16                                                                                  | 1489                                                                                | 44                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 169                                                                               | 0                                                                                 | 70                                                                                | 112                                                                               | 19                                                                                | 3                                                                                 | 185                                                                                 | 2671                                                                                | 47                                                                                  | 20                                                                                  | 2328                                                                                | 1042                                                                                |
| Arrive On Green              | 0.06                                                                              | 0.00                                                                              | 0.04                                                                              | 0.06                                                                              | 0.04                                                                              | 0.04                                                                              | 0.10                                                                                | 0.75                                                                                | 0.75                                                                                | 0.01                                                                                | 0.66                                                                                | 0.66                                                                                |
| Sat Flow, veh/h              | 1555                                                                              | 0                                                                                 | 1583                                                                              | 686                                                                               | 435                                                                               | 70                                                                                | 1774                                                                                | 3559                                                                                | 62                                                                                  | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 33                                                                                | 0                                                                                 | 1                                                                                 | 17                                                                                | 0                                                                                 | 0                                                                                 | 147                                                                                 | 597                                                                                 | 625                                                                                 | 16                                                                                  | 1489                                                                                | 44                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1555                                                                              | 0                                                                                 | 1583                                                                              | 1191                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1852                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 5.9                                                                                 | 9.2                                                                                 | 9.2                                                                                 | 0.7                                                                                 | 18.0                                                                                | 0.7                                                                                 |
| Cycle Q Clear(g_c), s        | 1.3                                                                               | 0.0                                                                               | 0.0                                                                               | 1.7                                                                               | 0.0                                                                               | 0.0                                                                               | 5.9                                                                                 | 9.2                                                                                 | 9.2                                                                                 | 0.7                                                                                 | 18.0                                                                                | 0.7                                                                                 |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.65                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                                |                                                                                     | 0.03                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 190                                                                               | 0                                                                                 | 70                                                                                | 151                                                                               | 0                                                                                 | 0                                                                                 | 185                                                                                 | 1328                                                                                | 1390                                                                                | 20                                                                                  | 2328                                                                                | 1042                                                                                |
| V/C Ratio(X)                 | 0.17                                                                              | 0.00                                                                              | 0.01                                                                              | 0.11                                                                              | 0.00                                                                              | 0.00                                                                              | 0.80                                                                                | 0.45                                                                                | 0.45                                                                                | 0.79                                                                                | 0.64                                                                                | 0.04                                                                                |
| Avail Cap(c_a), veh/h        | 575                                                                               | 0                                                                                 | 504                                                                               | 570                                                                               | 0                                                                                 | 0                                                                                 | 515                                                                                 | 2105                                                                                | 2203                                                                                | 270                                                                                 | 3721                                                                                | 1665                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 33.1                                                                              | 0.0                                                                               | 33.0                                                                              | 33.5                                                                              | 0.0                                                                               | 0.0                                                                               | 31.6                                                                                | 3.4                                                                                 | 3.4                                                                                 | 35.6                                                                                | 7.3                                                                                 | 4.4                                                                                 |
| Incr Delay (d2), s/veh       | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 2.9                                                                                 | 0.5                                                                                 | 0.5                                                                                 | 21.8                                                                                | 0.6                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.6                                                                               | 0.0                                                                               | 0.0                                                                               | 0.3                                                                               | 0.0                                                                               | 0.0                                                                               | 3.0                                                                                 | 4.5                                                                                 | 4.7                                                                                 | 0.4                                                                                 | 8.9                                                                                 | 0.3                                                                                 |
| LnGrp Delay(d),s/veh         | 33.3                                                                              | 0.0                                                                               | 33.1                                                                              | 33.6                                                                              | 0.0                                                                               | 0.0                                                                               | 34.6                                                                                | 3.9                                                                                 | 3.9                                                                                 | 57.5                                                                                | 7.9                                                                                 | 4.4                                                                                 |
| LnGrp LOS                    | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                 |                                                                                   |                                                                                   | C                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 34                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 17                                                                                |                                                                                     | 1369                                                                                |                                                                                     | 1549                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 33.3                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 33.6                                                                              |                                                                                     | 7.2                                                                                 |                                                                                     | 8.3                                                                                 |                                                                                     |                                                                                     |
| Approach LOS                 | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   | C                                                                                 |                                                                                     | A                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 4                                                                                 |                                                                                   | 5                                                                                 | 6                                                                                 | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 11.5                                                                              | 52.5                                                                              | 8.2                                                                               |                                                                                   | 4.8                                                                               | 59.3                                                                              | 8.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   | 4.0                                                                               | 5.0                                                                               | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 21.0                                                                              | 76.0                                                                              | 23.0                                                                              |                                                                                   | 11.0                                                                              | 86.0                                                                              | 23.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 7.9                                                                               | 20.0                                                                              | 3.7                                                                               |                                                                                   | 2.7                                                                               | 11.2                                                                              | 3.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.1                                                                               | 27.6                                                                              | 0.0                                                                               |                                                                                   | 0.0                                                                               | 18.9                                                                              | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 8.2                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 6: Honoapiilani Highway & Kai Ala Drive/Puukolii Road

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 55                                                                                | 5                                                                                 | 35                                                                                | 40                                                                                | 15                                                                                | 45                                                                                | 110                                                                                 | 1270                                                                                | 60                                                                                  | 25                                                                                  | 1320                                                                                | 45                                                                                  |
| Future Volume (veh/h)        | 55                                                                                | 5                                                                                 | 35                                                                                | 40                                                                                | 15                                                                                | 45                                                                                | 110                                                                                 | 1270                                                                                | 60                                                                                  | 25                                                                                  | 1320                                                                                | 45                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 60                                                                                | 5                                                                                 | 1                                                                                 | 43                                                                                | 16                                                                                | 1                                                                                 | 120                                                                                 | 1380                                                                                | 50                                                                                  | 27                                                                                  | 1435                                                                                | 36                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 160                                                                               | 12                                                                                | 153                                                                               | 111                                                                               | 168                                                                               | 10                                                                                | 142                                                                                 | 2776                                                                                | 1242                                                                                | 39                                                                                  | 2571                                                                                | 1150                                                                                |
| Arrive On Green              | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.08                                                                                | 0.78                                                                                | 0.78                                                                                | 0.02                                                                                | 0.73                                                                                | 0.73                                                                                |
| Sat Flow, veh/h              | 1193                                                                              | 120                                                                               | 1578                                                                              | 1401                                                                              | 1735                                                                              | 108                                                                               | 1774                                                                                | 3539                                                                                | 1583                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 65                                                                                | 0                                                                                 | 1                                                                                 | 43                                                                                | 0                                                                                 | 17                                                                                | 120                                                                                 | 1380                                                                                | 50                                                                                  | 27                                                                                  | 1435                                                                                | 36                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1313                                                                              | 0                                                                                 | 1578                                                                              | 1401                                                                              | 0                                                                                 | 1843                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 6.6                                                                               | 0.0                                                                               | 0.1                                                                               | 4.7                                                                               | 0.0                                                                               | 1.3                                                                               | 10.3                                                                                | 21.4                                                                                | 1.1                                                                                 | 2.3                                                                                 | 28.9                                                                                | 1.0                                                                                 |
| Cycle Q Clear(g_c), s        | 7.9                                                                               | 0.0                                                                               | 0.1                                                                               | 12.5                                                                              | 0.0                                                                               | 1.3                                                                               | 10.3                                                                                | 21.4                                                                                | 1.1                                                                                 | 2.3                                                                                 | 28.9                                                                                | 1.0                                                                                 |
| Prop In Lane                 | 0.92                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 172                                                                               | 0                                                                                 | 153                                                                               | 111                                                                               | 0                                                                                 | 178                                                                               | 142                                                                                 | 2776                                                                                | 1242                                                                                | 39                                                                                  | 2571                                                                                | 1150                                                                                |
| V/C Ratio(X)                 | 0.38                                                                              | 0.00                                                                              | 0.01                                                                              | 0.39                                                                              | 0.00                                                                              | 0.10                                                                              | 0.85                                                                                | 0.50                                                                                | 0.04                                                                                | 0.69                                                                                | 0.56                                                                                | 0.03                                                                                |
| Avail Cap(c_a), veh/h        | 254                                                                               | 0                                                                                 | 244                                                                               | 192                                                                               | 0                                                                                 | 285                                                                               | 240                                                                                 | 2776                                                                                | 1242                                                                                | 240                                                                                 | 2571                                                                                | 1150                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.73                                                                                | 0.73                                                                                | 0.73                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 67.3                                                                              | 0.0                                                                               | 63.3                                                                              | 72.8                                                                              | 0.0                                                                               | 63.8                                                                              | 70.4                                                                                | 5.9                                                                                 | 3.7                                                                                 | 75.2                                                                                | 9.7                                                                                 | 5.9                                                                                 |
| Incr Delay (d2), s/veh       | 1.4                                                                               | 0.0                                                                               | 0.0                                                                               | 2.2                                                                               | 0.0                                                                               | 0.2                                                                               | 3.9                                                                                 | 0.5                                                                                 | 0.0                                                                                 | 7.6                                                                                 | 0.9                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 2.7                                                                               | 0.0                                                                               | 0.0                                                                               | 1.9                                                                               | 0.0                                                                               | 0.7                                                                               | 5.2                                                                                 | 10.5                                                                                | 0.5                                                                                 | 1.2                                                                                 | 14.3                                                                                | 0.4                                                                                 |
| LnGrp Delay(d),s/veh         | 68.7                                                                              | 0.0                                                                               | 63.3                                                                              | 75.0                                                                              | 0.0                                                                               | 64.1                                                                              | 74.2                                                                                | 6.4                                                                                 | 3.8                                                                                 | 82.9                                                                                | 10.6                                                                                | 6.0                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                   | A                                                                                   | A                                                                                   | F                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 66                                                                                |                                                                                   |                                                                                   | 60                                                                                |                                                                                   |                                                                                     | 1550                                                                                |                                                                                     |                                                                                     | 1498                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 68.6                                                                              |                                                                                   |                                                                                   | 71.9                                                                              |                                                                                   |                                                                                     | 11.5                                                                                |                                                                                     |                                                                                     | 11.8                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 16.4                                                                              | 118.6                                                                             |                                                                                   | 20.0                                                                              | 7.4                                                                               | 127.6                                                                             |                                                                                     | 20.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 21.0                                                                              | 95.0                                                                              |                                                                                   | 24.0                                                                              | 21.0                                                                              | 95.0                                                                              |                                                                                     | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 12.3                                                                              | 30.9                                                                              |                                                                                   | 14.5                                                                              | 4.3                                                                               | 23.4                                                                              |                                                                                     | 9.9                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.1                                                                               | 27.3                                                                              |                                                                                   | 0.1                                                                               | 0.0                                                                               | 26.8                                                                              |                                                                                     | 0.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 14.0                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 7: Honoapiilani Highway & Kaanapali Parkway/Halelo Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |  |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 140                                                                               | 10                                                                                | 235                                                                               | 10                                                                                | 10                                                                                | 10                                                                                | 460                                                                                | 1345                                                                                | 15                                                                                  | 80                                                                                  | 1280                                                                                | 110                                                                                 |
| Future Volume (veh/h)        | 140                                                                               | 10                                                                                | 235                                                                               | 10                                                                                | 10                                                                                | 10                                                                                | 460                                                                                | 1345                                                                                | 15                                                                                  | 80                                                                                  | 1280                                                                                | 110                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 160                                                                               | 0                                                                                 | 67                                                                                | 11                                                                                | 11                                                                                | 3                                                                                 | 500                                                                                | 1462                                                                                | 16                                                                                  | 87                                                                                  | 1391                                                                                | 90                                                                                  |
| Adj No. of Lanes             | 2                                                                                 | 0                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 2                                                                                  | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 324                                                                               | 0                                                                                 | 839                                                                               | 59                                                                                | 59                                                                                | 16                                                                                | 636                                                                                | 2203                                                                                | 24                                                                                  | 146                                                                                 | 1811                                                                                | 938                                                                                 |
| Arrive On Green              | 0.09                                                                              | 0.00                                                                              | 0.08                                                                              | 0.08                                                                              | 0.08                                                                              | 0.05                                                                              | 0.18                                                                               | 0.61                                                                                | 0.60                                                                                | 0.08                                                                                | 0.51                                                                                | 0.51                                                                                |
| Sat Flow, veh/h              | 3548                                                                              | 0                                                                                 | 3071                                                                              | 783                                                                               | 783                                                                               | 214                                                                               | 3442                                                                               | 3586                                                                                | 39                                                                                  | 1774                                                                                | 3539                                                                                | 1578                                                                                |
| Grp Volume(v), veh/h         | 160                                                                               | 0                                                                                 | 67                                                                                | 25                                                                                | 0                                                                                 | 0                                                                                 | 500                                                                                | 721                                                                                 | 757                                                                                 | 87                                                                                  | 1391                                                                                | 90                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1774                                                                              | 0                                                                                 | 1535                                                                              | 1779                                                                              | 0                                                                                 | 0                                                                                 | 1721                                                                               | 1770                                                                                | 1856                                                                                | 1774                                                                                | 1770                                                                                | 1578                                                                                |
| Q Serve(g_s), s              | 5.0                                                                               | 0.0                                                                               | 1.9                                                                               | 1.5                                                                               | 0.0                                                                               | 0.0                                                                               | 16.2                                                                               | 31.0                                                                                | 31.0                                                                                | 5.5                                                                                 | 36.9                                                                                | 2.9                                                                                 |
| Cycle Q Clear(g_c), s        | 5.0                                                                               | 0.0                                                                               | 1.9                                                                               | 1.5                                                                               | 0.0                                                                               | 0.0                                                                               | 16.2                                                                               | 31.0                                                                                | 31.0                                                                                | 5.5                                                                                 | 36.9                                                                                | 2.9                                                                                 |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.44                                                                              |                                                                                   | 0.12                                                                              | 1.00                                                                               |                                                                                     | 0.02                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 324                                                                               | 0                                                                                 | 839                                                                               | 134                                                                               | 0                                                                                 | 0                                                                                 | 636                                                                                | 1087                                                                                | 1140                                                                                | 146                                                                                 | 1811                                                                                | 938                                                                                 |
| V/C Ratio(X)                 | 0.49                                                                              | 0.00                                                                              | 0.08                                                                              | 0.19                                                                              | 0.00                                                                              | 0.00                                                                              | 0.79                                                                               | 0.66                                                                                | 0.66                                                                                | 0.60                                                                                | 0.77                                                                                | 0.10                                                                                |
| Avail Cap(c_a), veh/h        | 1033                                                                              | 0                                                                                 | 1453                                                                              | 472                                                                               | 0                                                                                 | 0                                                                                 | 1709                                                                               | 2939                                                                                | 3082                                                                                | 228                                                                                 | 4574                                                                                | 2170                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 50.5                                                                              | 0.0                                                                               | 32.0                                                                              | 50.8                                                                              | 0.0                                                                               | 0.0                                                                               | 45.4                                                                               | 14.7                                                                                | 14.7                                                                                | 51.8                                                                                | 23.0                                                                                | 10.2                                                                                |
| Incr Delay (d2), s/veh       | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 0.8                                                                                | 1.0                                                                                 | 1.0                                                                                 | 1.5                                                                                 | 1.0                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 2.5                                                                               | 0.0                                                                               | 0.8                                                                               | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 7.8                                                                                | 15.3                                                                                | 16.1                                                                                | 2.8                                                                                 | 18.2                                                                                | 1.5                                                                                 |
| LnGrp Delay(d),s/veh         | 51.0                                                                              | 0.0                                                                               | 32.1                                                                              | 51.5                                                                              | 0.0                                                                               | 0.0                                                                               | 46.2                                                                               | 15.7                                                                                | 15.6                                                                                | 53.2                                                                                | 24.0                                                                                | 10.3                                                                                |
| LnGrp LOS                    | D                                                                                 |                                                                                   | C                                                                                 | D                                                                                 |                                                                                   |                                                                                   | D                                                                                  | B                                                                                   | B                                                                                   | D                                                                                   | C                                                                                   | B                                                                                   |
| Approach Vol, veh/h          | 227                                                                               |                                                                                   |                                                                                   |                                                                                   | 25                                                                                |                                                                                   |                                                                                    |                                                                                     | 1978                                                                                |                                                                                     | 1568                                                                                |                                                                                     |
| Approach Delay, s/veh        | 45.4                                                                              |                                                                                   |                                                                                   |                                                                                   | 51.5                                                                              |                                                                                   |                                                                                    |                                                                                     | 23.4                                                                                |                                                                                     | 24.8                                                                                |                                                                                     |
| Approach LOS                 | D                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                    |                                                                                     | C                                                                                   |                                                                                     | C                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 25.6                                                                              | 63.8                                                                              |                                                                                   |                                                                                   | 12.8                                                                              | 13.6                                                                              | 75.8                                                                               | 14.7                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 6.0                                                                               | 6.0                                                                               |                                                                                   |                                                                                   | 7.0                                                                               | 6.0                                                                               | 6.0                                                                                | 7.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 56.0                                                                              | 149.0                                                                             |                                                                                   |                                                                                   | 28.0                                                                              | 13.0                                                                              | 192.0                                                                              | 31.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 18.2                                                                              | 38.9                                                                              |                                                                                   |                                                                                   | 3.5                                                                               | 7.5                                                                               | 33.0                                                                               | 7.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 1.4                                                                               | 18.8                                                                              |                                                                                   |                                                                                   | 0.0                                                                               | 0.1                                                                               | 17.4                                                                               | 0.6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 25.5                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 8: Honoapiilani Highway & Leialii Parkway

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |                                                                                     |
| Traffic Volume (veh/h)       | 5                                                                                 | 5                                                                                 | 5                                                                                 | 60                                                                                | 0                                                                                 | 45                                                                                | 5                                                                                   | 1825                                                                                | 90                                                                                  | 30                                                                                  | 1475                                                                                | 5                                                                                   |
| Future Volume (veh/h)        | 5                                                                                 | 5                                                                                 | 5                                                                                 | 60                                                                                | 0                                                                                 | 45                                                                                | 5                                                                                   | 1825                                                                                | 90                                                                                  | 30                                                                                  | 1475                                                                                | 5                                                                                   |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                              |                                                                                   | 0.97                                                                              | 0.98                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 5                                                                                 | 5                                                                                 | 1                                                                                 | 65                                                                                | 0                                                                                 | 1                                                                                 | 5                                                                                   | 1984                                                                                | 96                                                                                  | 33                                                                                  | 1603                                                                                | 5                                                                                   |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 90                                                                                | 80                                                                                | 13                                                                                | 176                                                                               | 0                                                                                 | 138                                                                               | 11                                                                                  | 2713                                                                                | 130                                                                                 | 63                                                                                  | 2962                                                                                | 9                                                                                   |
| Arrive On Green              | 0.09                                                                              | 0.09                                                                              | 0.08                                                                              | 0.09                                                                              | 0.00                                                                              | 0.08                                                                              | 0.01                                                                                | 0.79                                                                                | 0.78                                                                                | 0.04                                                                                | 0.82                                                                                | 0.81                                                                                |
| Sat Flow, veh/h              | 584                                                                               | 895                                                                               | 148                                                                               | 1372                                                                              | 0                                                                                 | 1543                                                                              | 1774                                                                                | 3438                                                                                | 165                                                                                 | 1774                                                                                | 3619                                                                                | 11                                                                                  |
| Grp Volume(v), veh/h         | 11                                                                                | 0                                                                                 | 0                                                                                 | 65                                                                                | 0                                                                                 | 1                                                                                 | 5                                                                                   | 1013                                                                                | 1067                                                                                | 33                                                                                  | 784                                                                                 | 824                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1627                                                                              | 0                                                                                 | 0                                                                                 | 1372                                                                              | 0                                                                                 | 1543                                                                              | 1774                                                                                | 1770                                                                                | 1833                                                                                | 1774                                                                                | 1770                                                                                | 1861                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 5.4                                                                               | 0.0                                                                               | 0.1                                                                               | 0.4                                                                                 | 39.6                                                                                | 41.2                                                                                | 2.6                                                                                 | 20.2                                                                                | 20.2                                                                                |
| Cycle Q Clear(g_c), s        | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 6.1                                                                               | 0.0                                                                               | 0.1                                                                               | 0.4                                                                                 | 39.6                                                                                | 41.2                                                                                | 2.6                                                                                 | 20.2                                                                                | 20.2                                                                                |
| Prop In Lane                 | 0.45                                                                              |                                                                                   | 0.09                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 0.09                                                                                | 1.00                                                                                |                                                                                     | 0.01                                                                                |
| Lane Grp Cap(c), veh/h       | 183                                                                               | 0                                                                                 | 0                                                                                 | 176                                                                               | 0                                                                                 | 138                                                                               | 11                                                                                  | 1396                                                                                | 1447                                                                                | 63                                                                                  | 1448                                                                                | 1523                                                                                |
| V/C Ratio(X)                 | 0.06                                                                              | 0.00                                                                              | 0.00                                                                              | 0.37                                                                              | 0.00                                                                              | 0.01                                                                              | 0.45                                                                                | 0.73                                                                                | 0.74                                                                                | 0.52                                                                                | 0.54                                                                                | 0.54                                                                                |
| Avail Cap(c_a), veh/h        | 312                                                                               | 0                                                                                 | 0                                                                                 | 289                                                                               | 0                                                                                 | 265                                                                               | 101                                                                                 | 1396                                                                                | 1447                                                                                | 101                                                                                 | 1448                                                                                | 1523                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(l)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.59                                                                                | 0.59                                                                                | 0.59                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 58.4                                                                              | 0.0                                                                               | 0.0                                                                               | 60.7                                                                              | 0.0                                                                               | 58.5                                                                              | 69.3                                                                                | 7.3                                                                                 | 7.5                                                                                 | 66.3                                                                                | 4.1                                                                                 | 4.1                                                                                 |
| Incr Delay (d2), s/veh       | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 1.3                                                                               | 0.0                                                                               | 0.0                                                                               | 6.0                                                                                 | 2.0                                                                                 | 2.0                                                                                 | 2.5                                                                                 | 1.5                                                                                 | 1.4                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 2.5                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                                 | 19.6                                                                                | 21.3                                                                                | 1.3                                                                                 | 10.2                                                                                | 10.7                                                                                |
| LnGrp Delay(d),s/veh         | 58.6                                                                              | 0.0                                                                               | 0.0                                                                               | 62.0                                                                              | 0.0                                                                               | 58.6                                                                              | 75.4                                                                                | 9.3                                                                                 | 9.5                                                                                 | 68.8                                                                                | 5.6                                                                                 | 5.5                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 11                                                                                |                                                                                   |                                                                                   | 66                                                                                |                                                                                   |                                                                                     | 2085                                                                                |                                                                                     |                                                                                     | 1641                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 58.6                                                                              |                                                                                   |                                                                                   | 62.0                                                                              |                                                                                   |                                                                                     | 9.6                                                                                 |                                                                                     |                                                                                     | 6.8                                                                                 |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 4.9                                                                               | 118.6                                                                             |                                                                                   | 16.5                                                                              | 9.0                                                                               | 114.5                                                                             |                                                                                     | 16.5                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 8.0                                                                               | 95.0                                                                              |                                                                                   | 23.0                                                                              | 8.0                                                                               | 95.0                                                                              |                                                                                     | 23.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.4                                                                               | 22.2                                                                              |                                                                                   | 8.1                                                                               | 4.6                                                                               | 43.2                                                                              |                                                                                     | 2.8                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 32.7                                                                              |                                                                                   | 0.1                                                                               | 0.0                                                                               | 41.1                                                                              |                                                                                     | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   |                                                                                   | 9.4                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 9: Honoapiilani Highway & Front Street/Flemming Road

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |                                                                                   |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 90                                                                                | 5                                                                                 | 5                                                                                 | 105                                                                               | 15                                                                                | 15                                                                                | 5                                                                                   | 1805                                                                                | 20                                                                                  | 10                                                                                  | 1315                                                                                | 185                                                                                 |
| Future Volume (veh/h)        | 90                                                                                | 5                                                                                 | 5                                                                                 | 105                                                                               | 15                                                                                | 15                                                                                | 5                                                                                   | 1805                                                                                | 20                                                                                  | 10                                                                                  | 1315                                                                                | 185                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 98                                                                                | 5                                                                                 | 3                                                                                 | 114                                                                               | 16                                                                                | 12                                                                                | 5                                                                                   | 1962                                                                                | 22                                                                                  | 11                                                                                  | 1429                                                                                | 144                                                                                 |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 0                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 210                                                                               | 8                                                                                 | 5                                                                                 | 198                                                                               | 20                                                                                | 15                                                                                | 7                                                                                   | 2805                                                                                | 31                                                                                  | 14                                                                                  | 2782                                                                                | 1243                                                                                |
| Arrive On Green              | 0.11                                                                              | 0.11                                                                              | 0.10                                                                              | 0.11                                                                              | 0.11                                                                              | 0.10                                                                              | 0.00                                                                                | 0.78                                                                                | 0.77                                                                                | 0.01                                                                                | 0.79                                                                                | 0.79                                                                                |
| Sat Flow, veh/h              | 1387                                                                              | 71                                                                                | 42                                                                                | 1312                                                                              | 184                                                                               | 138                                                                               | 1774                                                                                | 3585                                                                                | 40                                                                                  | 1774                                                                                | 3539                                                                                | 1581                                                                                |
| Grp Volume(v), veh/h         | 106                                                                               | 0                                                                                 | 0                                                                                 | 142                                                                               | 0                                                                                 | 0                                                                                 | 5                                                                                   | 967                                                                                 | 1017                                                                                | 11                                                                                  | 1429                                                                                | 144                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1500                                                                              | 0                                                                                 | 0                                                                                 | 1634                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1856                                                                                | 1774                                                                                | 1770                                                                                | 1581                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 1.8                                                                               | 0.0                                                                               | 0.0                                                                               | 0.3                                                                                 | 31.4                                                                                | 31.7                                                                                | 0.7                                                                                 | 17.4                                                                                | 2.6                                                                                 |
| Cycle Q Clear(g_c), s        | 7.9                                                                               | 0.0                                                                               | 0.0                                                                               | 9.8                                                                               | 0.0                                                                               | 0.0                                                                               | 0.3                                                                                 | 31.4                                                                                | 31.7                                                                                | 0.7                                                                                 | 17.4                                                                                | 2.6                                                                                 |
| Prop In Lane                 | 0.92                                                                              |                                                                                   | 0.03                                                                              | 0.80                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                                |                                                                                     | 0.02                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 223                                                                               | 0                                                                                 | 0                                                                                 | 234                                                                               | 0                                                                                 | 0                                                                                 | 7                                                                                   | 1384                                                                                | 1452                                                                                | 14                                                                                  | 2782                                                                                | 1243                                                                                |
| V/C Ratio(X)                 | 0.48                                                                              | 0.00                                                                              | 0.00                                                                              | 0.61                                                                              | 0.00                                                                              | 0.00                                                                              | 0.73                                                                                | 0.70                                                                                | 0.70                                                                                | 0.81                                                                                | 0.51                                                                                | 0.12                                                                                |
| Avail Cap(c_a), veh/h        | 430                                                                               | 0                                                                                 | 0                                                                                 | 450                                                                               | 0                                                                                 | 0                                                                                 | 118                                                                                 | 1384                                                                                | 1452                                                                                | 118                                                                                 | 2782                                                                                | 1243                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.60                                                                                | 0.60                                                                                | 0.60                                                                                | 0.83                                                                                | 0.83                                                                                | 0.83                                                                                |
| Uniform Delay (d), s/veh     | 51.1                                                                              | 0.0                                                                               | 0.0                                                                               | 51.8                                                                              | 0.0                                                                               | 0.0                                                                               | 59.7                                                                                | 6.3                                                                                 | 6.3                                                                                 | 59.5                                                                                | 4.6                                                                                 | 3.0                                                                                 |
| Incr Delay (d2), s/veh       | 1.6                                                                               | 0.0                                                                               | 0.0                                                                               | 2.5                                                                               | 0.0                                                                               | 0.0                                                                               | 28.3                                                                                | 1.8                                                                                 | 1.7                                                                                 | 28.1                                                                                | 0.6                                                                                 | 0.2                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 3.5                                                                               | 0.0                                                                               | 0.0                                                                               | 4.7                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                                 | 15.7                                                                                | 16.5                                                                                | 0.5                                                                                 | 8.6                                                                                 | 1.2                                                                                 |
| LnGrp Delay(d),s/veh         | 52.6                                                                              | 0.0                                                                               | 0.0                                                                               | 54.3                                                                              | 0.0                                                                               | 0.0                                                                               | 88.0                                                                                | 8.0                                                                                 | 8.0                                                                                 | 87.5                                                                                | 5.2                                                                                 | 3.2                                                                                 |
| LnGrp LOS                    | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | F                                                                                   | A                                                                                   | A                                                                                   | F                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 106                                                                               |                                                                                   |                                                                                   | 142                                                                               |                                                                                   |                                                                                     | 1989                                                                                |                                                                                     |                                                                                     | 1584                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 52.6                                                                              |                                                                                   |                                                                                   | 54.3                                                                              |                                                                                   |                                                                                     | 8.2                                                                                 |                                                                                     |                                                                                     | 5.6                                                                                 |                                                                                     |
| Approach LOS                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 4.5                                                                               | 98.3                                                                              |                                                                                   | 17.2                                                                              | 4.9                                                                               | 97.9                                                                              |                                                                                     | 17.2                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 8.0                                                                               | 68.0                                                                              |                                                                                   | 30.0                                                                              | 8.0                                                                               | 68.0                                                                              |                                                                                     | 30.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.3                                                                               | 19.4                                                                              |                                                                                   | 11.8                                                                              | 2.7                                                                               | 33.7                                                                              |                                                                                     | 9.9                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 32.9                                                                              |                                                                                   | 0.5                                                                               | 0.0                                                                               | 31.0                                                                              |                                                                                     | 0.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   |                                                                                   | 10.1                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 10: Honoapiilani Highway & Kapunakea Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |                                                                                     |  |  |                                                                                     |
| Traffic Volume (veh/h)       | 145                                                                               | 30                                                                                | 20                                                                                | 145                                                                               | 25                                                                                | 35                                                                                | 25                                                                                 | 1625                                                                                | 75                                                                                  | 10                                                                                  | 1355                                                                                | 70                                                                                  |
| Future Volume (veh/h)        | 145                                                                               | 30                                                                                | 20                                                                                | 145                                                                               | 25                                                                                | 35                                                                                | 25                                                                                 | 1625                                                                                | 75                                                                                  | 10                                                                                  | 1355                                                                                | 70                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.98                                                                              | 0.99                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 158                                                                               | 33                                                                                | 2                                                                                 | 158                                                                               | 27                                                                                | 5                                                                                 | 27                                                                                 | 1766                                                                                | 80                                                                                  | 11                                                                                  | 1473                                                                                | 74                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 229                                                                               | 38                                                                                | 265                                                                               | 307                                                                               | 259                                                                               | 48                                                                                | 34                                                                                 | 2542                                                                                | 114                                                                                 | 13                                                                                  | 2488                                                                                | 125                                                                                 |
| Arrive On Green              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.16                                                                              | 0.04                                                                               | 1.00                                                                                | 1.00                                                                                | 0.01                                                                                | 0.73                                                                                | 0.72                                                                                |
| Sat Flow, veh/h              | 1070                                                                              | 224                                                                               | 1558                                                                              | 1358                                                                              | 1525                                                                              | 282                                                                               | 1774                                                                               | 3450                                                                                | 155                                                                                 | 1774                                                                                | 3430                                                                                | 172                                                                                 |
| Grp Volume(v), veh/h         | 191                                                                               | 0                                                                                 | 2                                                                                 | 158                                                                               | 0                                                                                 | 32                                                                                | 27                                                                                 | 901                                                                                 | 945                                                                                 | 11                                                                                  | 758                                                                                 | 789                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1294                                                                              | 0                                                                                 | 1558                                                                              | 1358                                                                              | 0                                                                                 | 1807                                                                              | 1774                                                                               | 1770                                                                                | 1835                                                                                | 1774                                                                                | 1770                                                                                | 1832                                                                                |
| Q Serve(g_s), s              | 18.4                                                                              | 0.0                                                                               | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 2.1                                                                               | 2.1                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.9                                                                                 | 28.8                                                                                | 29.1                                                                                |
| Cycle Q Clear(g_c), s        | 20.5                                                                              | 0.0                                                                               | 0.1                                                                               | 13.4                                                                              | 0.0                                                                               | 2.1                                                                               | 2.1                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.9                                                                                 | 28.8                                                                                | 29.1                                                                                |
| Prop In Lane                 | 0.83                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.16                                                                              | 1.00                                                                               |                                                                                     | 0.08                                                                                | 1.00                                                                                |                                                                                     | 0.09                                                                                |
| Lane Grp Cap(c), veh/h       | 267                                                                               | 0                                                                                 | 265                                                                               | 307                                                                               | 0                                                                                 | 307                                                                               | 34                                                                                 | 1304                                                                                | 1353                                                                                | 13                                                                                  | 1283                                                                                | 1329                                                                                |
| V/C Ratio(X)                 | 0.72                                                                              | 0.00                                                                              | 0.01                                                                              | 0.51                                                                              | 0.00                                                                              | 0.10                                                                              | 0.79                                                                               | 0.69                                                                                | 0.70                                                                                | 0.83                                                                                | 0.59                                                                                | 0.59                                                                                |
| Avail Cap(c_a), veh/h        | 310                                                                               | 0                                                                                 | 312                                                                               | 348                                                                               | 0                                                                                 | 361                                                                               | 139                                                                                | 1304                                                                                | 1353                                                                                | 139                                                                                 | 1283                                                                                | 1329                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 2.00                                                                               | 2.00                                                                                | 2.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.45                                                                               | 0.45                                                                                | 0.45                                                                                | 0.83                                                                                | 0.83                                                                                | 0.83                                                                                |
| Uniform Delay (d), s/veh     | 57.8                                                                              | 0.0                                                                               | 48.3                                                                              | 53.8                                                                              | 0.0                                                                               | 49.2                                                                              | 67.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 69.4                                                                                | 9.2                                                                                 | 9.3                                                                                 |
| Incr Delay (d2), s/veh       | 6.5                                                                               | 0.0                                                                               | 0.0                                                                               | 1.3                                                                               | 0.0                                                                               | 0.1                                                                               | 6.9                                                                                | 1.4                                                                                 | 1.4                                                                                 | 31.6                                                                                | 1.7                                                                                 | 1.6                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 7.7                                                                               | 0.0                                                                               | 0.1                                                                               | 5.8                                                                               | 0.0                                                                               | 1.1                                                                               | 1.1                                                                                | 0.5                                                                                 | 0.5                                                                                 | 0.5                                                                                 | 14.5                                                                                | 15.1                                                                                |
| LnGrp Delay(d),s/veh         | 64.2                                                                              | 0.0                                                                               | 48.3                                                                              | 55.1                                                                              | 0.0                                                                               | 49.3                                                                              | 74.0                                                                               | 1.4                                                                                 | 1.4                                                                                 | 101.0                                                                               | 10.9                                                                                | 10.9                                                                                |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | E                                                                                 |                                                                                   | D                                                                                 | E                                                                                  | A                                                                                   | A                                                                                   | F                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 193                                                                               |                                                                                   |                                                                                   | 190                                                                               |                                                                                   |                                                                                    | 1873                                                                                |                                                                                     |                                                                                     | 1558                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 64.1                                                                              |                                                                                   |                                                                                   | 54.2                                                                              |                                                                                   |                                                                                    | 2.4                                                                                 |                                                                                     |                                                                                     | 11.6                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                    | A                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 6.7                                                                               | 105.5                                                                             |                                                                                   | 27.8                                                                              | 5.0                                                                               | 107.2                                                                             |                                                                                    | 27.8                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 11.0                                                                              | 88.0                                                                              |                                                                                   | 27.0                                                                              | 11.0                                                                              | 88.0                                                                              |                                                                                    | 27.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 4.1                                                                               | 31.1                                                                              |                                                                                   | 15.4                                                                              | 2.9                                                                               | 2.0                                                                               |                                                                                    | 22.5                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 27.6                                                                              |                                                                                   | 0.5                                                                               | 0.0                                                                               | 47.4                                                                              |                                                                                    | 0.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   |                                                                                   | 11.9                                                                              |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 11: Honoapiilani Highway & Keawe Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 15                                                                                | 110                                                                               | 35                                                                                | 95                                                                                | 75                                                                                | 715                                                                               | 25                                                                                  | 925                                                                                 | 120                                                                                 | 515                                                                                 | 935                                                                                 | 20                                                                                  |
| Future Volume (veh/h)        | 15                                                                                | 110                                                                               | 35                                                                                | 95                                                                                | 75                                                                                | 715                                                                               | 25                                                                                  | 925                                                                                 | 120                                                                                 | 515                                                                                 | 935                                                                                 | 20                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.99                                                                              | 0.99                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 16                                                                                | 120                                                                               | 4                                                                                 | 103                                                                               | 82                                                                                | 457                                                                               | 27                                                                                  | 1005                                                                                | 55                                                                                  | 560                                                                                 | 1016                                                                                | 21                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   | 2                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 52                                                                                | 345                                                                               | 333                                                                               | 356                                                                               | 571                                                                               | 481                                                                               | 34                                                                                  | 1520                                                                                | 677                                                                                 | 614                                                                                 | 2087                                                                                | 43                                                                                  |
| Arrive On Green              | 0.21                                                                              | 0.21                                                                              | 0.21                                                                              | 0.07                                                                              | 0.31                                                                              | 0.31                                                                              | 0.02                                                                                | 0.43                                                                                | 0.43                                                                                | 0.36                                                                                | 1.00                                                                                | 1.00                                                                                |
| Sat Flow, veh/h              | 111                                                                               | 1622                                                                              | 1563                                                                              | 1774                                                                              | 1863                                                                              | 1569                                                                              | 1774                                                                                | 3539                                                                                | 1576                                                                                | 3442                                                                                | 3546                                                                                | 73                                                                                  |
| Grp Volume(v), veh/h         | 136                                                                               | 0                                                                                 | 4                                                                                 | 103                                                                               | 82                                                                                | 457                                                                               | 27                                                                                  | 1005                                                                                | 55                                                                                  | 560                                                                                 | 507                                                                                 | 530                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1733                                                                              | 0                                                                                 | 1563                                                                              | 1774                                                                              | 1863                                                                              | 1569                                                                              | 1774                                                                                | 1770                                                                                | 1576                                                                                | 1721                                                                                | 1770                                                                                | 1850                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.3                                                                               | 6.1                                                                               | 4.5                                                                               | 39.9                                                                              | 2.1                                                                                 | 31.7                                                                                | 2.9                                                                                 | 21.7                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Cycle Q Clear(g_c), s        | 8.7                                                                               | 0.0                                                                               | 0.3                                                                               | 6.1                                                                               | 4.5                                                                               | 39.9                                                                              | 2.1                                                                                 | 31.7                                                                                | 2.9                                                                                 | 21.7                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Prop In Lane                 | 0.12                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 0.04                                                                                |
| Lane Grp Cap(c), veh/h       | 398                                                                               | 0                                                                                 | 333                                                                               | 356                                                                               | 571                                                                               | 481                                                                               | 34                                                                                  | 1520                                                                                | 677                                                                                 | 614                                                                                 | 1041                                                                                | 1089                                                                                |
| V/C Ratio(X)                 | 0.34                                                                              | 0.00                                                                              | 0.01                                                                              | 0.29                                                                              | 0.14                                                                              | 0.95                                                                              | 0.79                                                                                | 0.66                                                                                | 0.08                                                                                | 0.91                                                                                | 0.49                                                                                | 0.49                                                                                |
| Avail Cap(c_a), veh/h        | 398                                                                               | 0                                                                                 | 333                                                                               | 443                                                                               | 572                                                                               | 482                                                                               | 177                                                                                 | 1520                                                                                | 677                                                                                 | 836                                                                                 | 1041                                                                                | 1089                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.79                                                                                | 0.79                                                                                | 0.79                                                                                | 0.70                                                                                | 0.70                                                                                | 0.70                                                                                |
| Uniform Delay (d), s/veh     | 46.8                                                                              | 0.0                                                                               | 43.5                                                                              | 37.7                                                                              | 35.2                                                                              | 47.5                                                                              | 68.4                                                                                | 31.8                                                                                | 23.6                                                                                | 44.0                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Incr Delay (d2), s/veh       | 0.5                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.1                                                                               | 28.7                                                                              | 11.4                                                                                | 1.8                                                                                 | 0.2                                                                                 | 7.1                                                                                 | 1.1                                                                                 | 1.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 4.5                                                                               | 0.0                                                                               | 0.1                                                                               | 3.0                                                                               | 2.3                                                                               | 21.1                                                                              | 1.2                                                                                 | 15.9                                                                                | 1.3                                                                                 | 10.9                                                                                | 0.3                                                                                 | 0.3                                                                                 |
| LnGrp Delay(d),s/veh         | 47.3                                                                              | 0.0                                                                               | 43.5                                                                              | 38.1                                                                              | 35.3                                                                              | 76.2                                                                              | 79.8                                                                                | 33.6                                                                                | 23.8                                                                                | 51.1                                                                                | 1.1                                                                                 | 1.1                                                                                 |
| LnGrp LOS                    | D                                                                                 |                                                                                   | D                                                                                 | D                                                                                 | D                                                                                 | E                                                                                 | E                                                                                   | C                                                                                   | C                                                                                   | D                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 140                                                                               |                                                                                   |                                                                                   | 642                                                                               |                                                                                   |                                                                                     | 1087                                                                                |                                                                                     |                                                                                     | 1597                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 47.2                                                                              |                                                                                   |                                                                                   | 64.8                                                                              |                                                                                   |                                                                                     | 34.3                                                                                |                                                                                     |                                                                                     | 18.6                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                     | C                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 6.7                                                                               | 86.4                                                                              | 13.1                                                                              | 33.8                                                                              | 29.0                                                                              | 64.1                                                                              |                                                                                     | 46.9                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 14.0                                                                              | 70.0                                                                              | 15.0                                                                              | 22.0                                                                              | 34.0                                                                              | 50.0                                                                              |                                                                                     | 42.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 4.1                                                                               | 2.0                                                                               | 8.1                                                                               | 10.7                                                                              | 23.7                                                                              | 33.7                                                                              |                                                                                     | 41.9                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 13.9                                                                              | 0.2                                                                               | 0.4                                                                               | 1.2                                                                               | 8.8                                                                               |                                                                                     | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 33.3                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



---

## **APPENDIX C**

### **LEVEL OF SERVICE CALCULATIONS**

- Base Year 2027 PM Peak
-

# HCM 2010 Signalized Intersection Summary

## 1: Napilihau Street

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 55                                                                                | 25                                                                                | 370                                                                               | 60                                                                                | 25                                                                                | 5                                                                                 | 380                                                                                 | 275                                                                                 | 65                                                                                  | 10                                                                                  | 375                                                                                 | 75                                                                                  |
| Future Volume (veh/h)        | 55                                                                                | 25                                                                                | 370                                                                               | 60                                                                                | 25                                                                                | 5                                                                                 | 380                                                                                 | 275                                                                                 | 65                                                                                  | 10                                                                                  | 375                                                                                 | 75                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 60                                                                                | 27                                                                                | 20                                                                                | 65                                                                                | 27                                                                                | 1                                                                                 | 413                                                                                 | 299                                                                                 | 46                                                                                  | 11                                                                                  | 408                                                                                 | 24                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 207                                                                               | 65                                                                                | 172                                                                               | 202                                                                               | 194                                                                               | 7                                                                                 | 489                                                                                 | 1112                                                                                | 945                                                                                 | 15                                                                                  | 614                                                                                 | 522                                                                                 |
| Arrive On Green              | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.28                                                                                | 0.60                                                                                | 0.60                                                                                | 0.01                                                                                | 0.33                                                                                | 0.33                                                                                |
| Sat Flow, veh/h              | 903                                                                               | 599                                                                               | 1583                                                                              | 1353                                                                              | 1785                                                                              | 66                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 87                                                                                | 0                                                                                 | 20                                                                                | 65                                                                                | 0                                                                                 | 28                                                                                | 413                                                                                 | 299                                                                                 | 46                                                                                  | 11                                                                                  | 408                                                                                 | 24                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1502                                                                              | 0                                                                                 | 1583                                                                              | 1353                                                                              | 0                                                                                 | 1851                                                                              | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 2.3                                                                               | 0.0                                                                               | 0.6                                                                               | 2.7                                                                               | 0.0                                                                               | 0.8                                                                               | 12.3                                                                                | 4.3                                                                                 | 0.7                                                                                 | 0.3                                                                                 | 10.5                                                                                | 0.6                                                                                 |
| Cycle Q Clear(g_c), s        | 3.1                                                                               | 0.0                                                                               | 0.6                                                                               | 5.7                                                                               | 0.0                                                                               | 0.8                                                                               | 12.3                                                                                | 4.3                                                                                 | 0.7                                                                                 | 0.3                                                                                 | 10.5                                                                                | 0.6                                                                                 |
| Prop In Lane                 | 0.69                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.04                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 272                                                                               | 0                                                                                 | 172                                                                               | 202                                                                               | 0                                                                                 | 201                                                                               | 489                                                                                 | 1112                                                                                | 945                                                                                 | 15                                                                                  | 614                                                                                 | 522                                                                                 |
| V/C Ratio(X)                 | 0.32                                                                              | 0.00                                                                              | 0.12                                                                              | 0.32                                                                              | 0.00                                                                              | 0.14                                                                              | 0.84                                                                                | 0.27                                                                                | 0.05                                                                                | 0.74                                                                                | 0.66                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h        | 752                                                                               | 0                                                                                 | 679                                                                               | 635                                                                               | 0                                                                                 | 794                                                                               | 952                                                                                 | 2631                                                                                | 2237                                                                                | 476                                                                                 | 2132                                                                                | 1812                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 23.5                                                                              | 0.0                                                                               | 22.5                                                                              | 26.3                                                                              | 0.0                                                                               | 22.6                                                                              | 19.1                                                                                | 5.4                                                                                 | 4.7                                                                                 | 27.7                                                                                | 16.1                                                                                | 12.8                                                                                |
| Incr Delay (d2), s/veh       | 0.7                                                                               | 0.0                                                                               | 0.3                                                                               | 0.9                                                                               | 0.0                                                                               | 0.3                                                                               | 4.1                                                                                 | 0.3                                                                                 | 0.0                                                                                 | 50.8                                                                                | 2.6                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.3                                                                               | 0.0                                                                               | 0.3                                                                               | 1.0                                                                               | 0.0                                                                               | 0.4                                                                               | 6.5                                                                                 | 2.2                                                                                 | 0.3                                                                                 | 0.4                                                                                 | 5.8                                                                                 | 0.3                                                                                 |
| LnGrp Delay(d),s/veh         | 24.2                                                                              | 0.0                                                                               | 22.8                                                                              | 27.2                                                                              | 0.0                                                                               | 22.9                                                                              | 23.2                                                                                | 5.7                                                                                 | 4.7                                                                                 | 78.4                                                                                | 18.7                                                                                | 12.8                                                                                |
| LnGrp LOS                    | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 107                                                                               |                                                                                   |                                                                                   | 93                                                                                |                                                                                   |                                                                                     | 758                                                                                 |                                                                                     |                                                                                     | 443                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 24.0                                                                              |                                                                                   |                                                                                   | 25.9                                                                              |                                                                                   |                                                                                     | 15.2                                                                                |                                                                                     |                                                                                     | 19.9                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.5                                                                               | 39.4                                                                              |                                                                                   | 11.1                                                                              | 20.4                                                                              | 24.4                                                                              |                                                                                     | 11.1                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 79.0                                                                              |                                                                                   | 24.0                                                                              | 30.0                                                                              | 64.0                                                                              |                                                                                     | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.3                                                                               | 6.3                                                                               |                                                                                   | 5.1                                                                               | 14.3                                                                              | 12.5                                                                              |                                                                                     | 7.7                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 4.4                                                                               |                                                                                   | 0.4                                                                               | 1.2                                                                               | 5.9                                                                               |                                                                                     | 0.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 18.1                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

## HCM 2010 Signalized Intersection Summary 2: Hoohui Road

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 75                                                                                | 20                                                                                | 150                                                                               | 45                                                                                | 15                                                                                | 10                                                                                | 195                                                                                 | 655                                                                                 | 45                                                                                  | 25                                                                                  | 675                                                                                 | 80                                                                                  |
| Future Volume (veh/h)        | 75                                                                                | 20                                                                                | 150                                                                               | 45                                                                                | 15                                                                                | 10                                                                                | 195                                                                                 | 655                                                                                 | 45                                                                                  | 25                                                                                  | 675                                                                                 | 80                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 82                                                                                | 22                                                                                | 12                                                                                | 49                                                                                | 16                                                                                | 1                                                                                 | 212                                                                                 | 712                                                                                 | 0                                                                                   | 27                                                                                  | 734                                                                                 | 49                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 257                                                                               | 55                                                                                | 204                                                                               | 222                                                                               | 224                                                                               | 14                                                                                | 400                                                                                 | 1040                                                                                | 884                                                                                 | 374                                                                                 | 898                                                                                 | 760                                                                                 |
| Arrive On Green              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.09                                                                                | 0.56                                                                                | 0.00                                                                                | 0.02                                                                                | 0.48                                                                                | 0.48                                                                                |
| Sat Flow, veh/h              | 1074                                                                              | 423                                                                               | 1583                                                                              | 1369                                                                              | 1735                                                                              | 108                                                                               | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1577                                                                                |
| Grp Volume(v), veh/h         | 104                                                                               | 0                                                                                 | 12                                                                                | 49                                                                                | 0                                                                                 | 17                                                                                | 212                                                                                 | 712                                                                                 | 0                                                                                   | 27                                                                                  | 734                                                                                 | 49                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1498                                                                              | 0                                                                                 | 1583                                                                              | 1369                                                                              | 0                                                                                 | 1844                                                                              | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1577                                                                                |
| Q Serve(g_s), s              | 3.0                                                                               | 0.0                                                                               | 0.4                                                                               | 1.9                                                                               | 0.0                                                                               | 0.4                                                                               | 3.0                                                                                 | 14.9                                                                                | 0.0                                                                                 | 0.4                                                                                 | 18.3                                                                                | 0.9                                                                                 |
| Cycle Q Clear(g_c), s        | 3.5                                                                               | 0.0                                                                               | 0.4                                                                               | 5.3                                                                               | 0.0                                                                               | 0.4                                                                               | 3.0                                                                                 | 14.9                                                                                | 0.0                                                                                 | 0.4                                                                                 | 18.3                                                                                | 0.9                                                                                 |
| Prop In Lane                 | 0.79                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 312                                                                               | 0                                                                                 | 204                                                                               | 222                                                                               | 0                                                                                 | 238                                                                               | 400                                                                                 | 1040                                                                                | 884                                                                                 | 374                                                                                 | 898                                                                                 | 760                                                                                 |
| V/C Ratio(X)                 | 0.33                                                                              | 0.00                                                                              | 0.06                                                                              | 0.22                                                                              | 0.00                                                                              | 0.07                                                                              | 0.53                                                                                | 0.68                                                                                | 0.00                                                                                | 0.07                                                                                | 0.82                                                                                | 0.06                                                                                |
| Avail Cap(c_a), veh/h        | 798                                                                               | 0                                                                                 | 728                                                                               | 675                                                                               | 0                                                                                 | 848                                                                               | 722                                                                                 | 1748                                                                                | 1485                                                                                | 831                                                                                 | 1748                                                                                | 1479                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 0.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 22.1                                                                              | 0.0                                                                               | 20.8                                                                              | 24.6                                                                              | 0.0                                                                               | 20.8                                                                              | 10.0                                                                                | 8.6                                                                                 | 0.0                                                                                 | 8.0                                                                                 | 12.0                                                                                | 7.5                                                                                 |
| Incr Delay (d2), s/veh       | 0.6                                                                               | 0.0                                                                               | 0.1                                                                               | 0.5                                                                               | 0.0                                                                               | 0.1                                                                               | 1.1                                                                                 | 0.8                                                                                 | 0.0                                                                                 | 0.1                                                                                 | 1.9                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.5                                                                               | 0.0                                                                               | 0.2                                                                               | 0.7                                                                               | 0.0                                                                               | 0.2                                                                               | 1.7                                                                                 | 7.7                                                                                 | 0.0                                                                                 | 0.2                                                                                 | 9.6                                                                                 | 0.4                                                                                 |
| LnGrp Delay(d),s/veh         | 22.7                                                                              | 0.0                                                                               | 20.9                                                                              | 25.1                                                                              | 0.0                                                                               | 20.9                                                                              | 11.1                                                                                | 9.4                                                                                 | 0.0                                                                                 | 8.1                                                                                 | 13.9                                                                                | 7.6                                                                                 |
| LnGrp LOS                    | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                 |                                                                                   | C                                                                                 | B                                                                                   | A                                                                                   |                                                                                     | A                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 116                                                                               |                                                                                   |                                                                                   | 66                                                                                |                                                                                   |                                                                                     | 924                                                                                 |                                                                                     |                                                                                     | 810                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 22.5                                                                              |                                                                                   |                                                                                   | 24.0                                                                              |                                                                                   |                                                                                     | 9.8                                                                                 |                                                                                     |                                                                                     | 13.4                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 6.0                                                                               | 36.3                                                                              |                                                                                   | 12.0                                                                              | 10.2                                                                              | 32.2                                                                              |                                                                                     | 12.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 51.0                                                                              |                                                                                   | 25.0                                                                              | 15.0                                                                              | 51.0                                                                              |                                                                                     | 25.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.4                                                                               | 16.9                                                                              |                                                                                   | 5.5                                                                               | 5.0                                                                               | 20.3                                                                              |                                                                                     | 7.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 5.5                                                                               |                                                                                   | 0.5                                                                               | 0.4                                                                               | 5.9                                                                               |                                                                                     | 0.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 12.6                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 3: Honoapiilani Highway & Akahele Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 60                                                                                | 5                                                                                 | 95                                                                                | 10                                                                                | 5                                                                                 | 10                                                                                | 165                                                                                | 890                                                                                 | 10                                                                                  | 5                                                                                   | 870                                                                                 | 75                                                                                  |
| Future Volume (veh/h)        | 60                                                                                | 5                                                                                 | 95                                                                                | 10                                                                                | 5                                                                                 | 10                                                                                | 165                                                                                | 890                                                                                 | 10                                                                                  | 5                                                                                   | 870                                                                                 | 75                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                  | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 65                                                                                | 5                                                                                 | 4                                                                                 | 11                                                                                | 5                                                                                 | 1                                                                                 | 179                                                                                | 967                                                                                 | 8                                                                                   | 5                                                                                   | 946                                                                                 | 44                                                                                  |
| Adj No. of Lanes             | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 85                                                                                | 103                                                                               | 83                                                                                | 14                                                                                | 130                                                                               | 106                                                                               | 216                                                                                | 1253                                                                                | 1065                                                                                | 7                                                                                   | 1033                                                                                | 876                                                                                 |
| Arrive On Green              | 0.05                                                                              | 0.11                                                                              | 0.11                                                                              | 0.01                                                                              | 0.07                                                                              | 0.07                                                                              | 0.12                                                                               | 0.67                                                                                | 0.67                                                                                | 0.00                                                                                | 0.55                                                                                | 0.55                                                                                |
| Sat Flow, veh/h              | 1774                                                                              | 944                                                                               | 756                                                                               | 1774                                                                              | 1863                                                                              | 1530                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1580                                                                                |
| Grp Volume(v), veh/h         | 65                                                                                | 0                                                                                 | 9                                                                                 | 11                                                                                | 5                                                                                 | 1                                                                                 | 179                                                                                | 967                                                                                 | 8                                                                                   | 5                                                                                   | 946                                                                                 | 44                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1774                                                                              | 0                                                                                 | 1700                                                                              | 1774                                                                              | 1863                                                                              | 1530                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1580                                                                                |
| Q Serve(g_s), s              | 3.5                                                                               | 0.0                                                                               | 0.5                                                                               | 0.6                                                                               | 0.2                                                                               | 0.1                                                                               | 9.6                                                                                | 34.3                                                                                | 0.2                                                                                 | 0.3                                                                                 | 44.6                                                                                | 1.2                                                                                 |
| Cycle Q Clear(g_c), s        | 3.5                                                                               | 0.0                                                                               | 0.5                                                                               | 0.6                                                                               | 0.2                                                                               | 0.1                                                                               | 9.6                                                                                | 34.3                                                                                | 0.2                                                                                 | 0.3                                                                                 | 44.6                                                                                | 1.2                                                                                 |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 0.44                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 85                                                                                | 0                                                                                 | 186                                                                               | 14                                                                                | 130                                                                               | 106                                                                               | 216                                                                                | 1253                                                                                | 1065                                                                                | 7                                                                                   | 1033                                                                                | 876                                                                                 |
| V/C Ratio(X)                 | 0.77                                                                              | 0.00                                                                              | 0.05                                                                              | 0.78                                                                              | 0.04                                                                              | 0.01                                                                              | 0.83                                                                               | 0.77                                                                                | 0.01                                                                                | 0.72                                                                                | 0.92                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h        | 366                                                                               | 0                                                                                 | 368                                                                               | 366                                                                               | 403                                                                               | 331                                                                               | 457                                                                                | 1253                                                                                | 1065                                                                                | 457                                                                                 | 1247                                                                                | 1058                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 45.7                                                                              | 0.0                                                                               | 38.7                                                                              | 48.1                                                                              | 42.1                                                                              | 42.0                                                                              | 41.6                                                                               | 10.8                                                                                | 5.2                                                                                 | 48.3                                                                                | 19.6                                                                                | 9.9                                                                                 |
| Incr Delay (d2), s/veh       | 13.3                                                                              | 0.0                                                                               | 0.1                                                                               | 61.0                                                                              | 0.1                                                                               | 0.0                                                                               | 7.8                                                                                | 3.0                                                                                 | 0.0                                                                                 | 86.6                                                                                | 9.4                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 2.0                                                                               | 0.0                                                                               | 0.2                                                                               | 0.5                                                                               | 0.1                                                                               | 0.0                                                                               | 5.1                                                                                | 18.5                                                                                | 0.1                                                                                 | 0.3                                                                                 | 25.3                                                                                | 0.5                                                                                 |
| LnGrp Delay(d),s/veh         | 59.0                                                                              | 0.0                                                                               | 38.8                                                                              | 109.1                                                                             | 42.2                                                                              | 42.1                                                                              | 49.4                                                                               | 13.8                                                                                | 5.2                                                                                 | 134.9                                                                               | 29.0                                                                                | 9.9                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | F                                                                                 | D                                                                                 | D                                                                                 | D                                                                                  | B                                                                                   | A                                                                                   | F                                                                                   | C                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 74                                                                                |                                                                                   |                                                                                   | 17                                                                                |                                                                                   |                                                                                    | 1154                                                                                |                                                                                     |                                                                                     | 995                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 56.5                                                                              |                                                                                   |                                                                                   | 85.5                                                                              |                                                                                   |                                                                                    | 19.3                                                                                |                                                                                     |                                                                                     | 28.7                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | F                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.4                                                                               | 70.3                                                                              | 5.8                                                                               | 15.6                                                                              | 16.8                                                                              | 58.8                                                                              | 9.6                                                                                | 11.8                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              | 25.0                                                                              | 65.0                                                                              | 20.0                                                                               | 21.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.3                                                                               | 36.3                                                                              | 2.6                                                                               | 2.5                                                                               | 11.6                                                                              | 46.6                                                                              | 5.5                                                                                | 2.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 8.9                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 7.2                                                                               | 0.1                                                                                | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 25.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 4: Honoapiilani Highway & Lower Honoapiilani Road

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 75                                                                                | 5                                                                                 | 600                                                                               | 80                                                                                | 10                                                                                | 10                                                                                | 605                                                                                 | 935                                                                                 | 10                                                                                  | 5                                                                                   | 920                                                                                 | 20                                                                                  |
| Future Volume (veh/h)        | 75                                                                                | 5                                                                                 | 600                                                                               | 80                                                                                | 10                                                                                | 10                                                                                | 605                                                                                 | 935                                                                                 | 10                                                                                  | 5                                                                                   | 920                                                                                 | 20                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 82                                                                                | 5                                                                                 | 0                                                                                 | 87                                                                                | 11                                                                                | 9                                                                                 | 658                                                                                 | 1016                                                                                | 11                                                                                  | 5                                                                                   | 1000                                                                                | 6                                                                                   |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 187                                                                               | 7                                                                                 | 134                                                                               | 173                                                                               | 14                                                                                | 12                                                                                | 696                                                                                 | 2769                                                                                | 30                                                                                  | 7                                                                                   | 1357                                                                                | 607                                                                                 |
| Arrive On Green              | 0.09                                                                              | 0.08                                                                              | 0.00                                                                              | 0.09                                                                              | 0.08                                                                              | 0.08                                                                              | 0.39                                                                                | 0.77                                                                                | 0.77                                                                                | 0.00                                                                                | 0.38                                                                                | 0.38                                                                                |
| Sat Flow, veh/h              | 1444                                                                              | 88                                                                                | 1583                                                                              | 1331                                                                              | 168                                                                               | 138                                                                               | 1774                                                                                | 3587                                                                                | 39                                                                                  | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 87                                                                                | 0                                                                                 | 0                                                                                 | 107                                                                               | 0                                                                                 | 0                                                                                 | 658                                                                                 | 501                                                                                 | 526                                                                                 | 5                                                                                   | 1000                                                                                | 6                                                                                   |
| Grp Sat Flow(s),veh/h/ln     | 1532                                                                              | 0                                                                                 | 1583                                                                              | 1637                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1856                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 38.6                                                                                | 9.7                                                                                 | 9.7                                                                                 | 0.3                                                                                 | 26.2                                                                                | 0.3                                                                                 |
| Cycle Q Clear(g_c), s        | 5.6                                                                               | 0.0                                                                               | 0.0                                                                               | 6.4                                                                               | 0.0                                                                               | 0.0                                                                               | 38.6                                                                                | 9.7                                                                                 | 9.7                                                                                 | 0.3                                                                                 | 26.2                                                                                | 0.3                                                                                 |
| Prop In Lane                 | 0.94                                                                              |                                                                                   | 1.00                                                                              | 0.81                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                                |                                                                                     | 0.02                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 209                                                                               | 0                                                                                 | 134                                                                               | 215                                                                               | 0                                                                                 | 0                                                                                 | 696                                                                                 | 1366                                                                                | 1433                                                                                | 7                                                                                   | 1357                                                                                | 607                                                                                 |
| V/C Ratio(X)                 | 0.42                                                                              | 0.00                                                                              | 0.00                                                                              | 0.50                                                                              | 0.00                                                                              | 0.00                                                                              | 0.95                                                                                | 0.37                                                                                | 0.37                                                                                | 0.73                                                                                | 0.74                                                                                | 0.01                                                                                |
| Avail Cap(c_a), veh/h        | 351                                                                               | 0                                                                                 | 294                                                                               | 429                                                                               | 0                                                                                 | 0                                                                                 | 1169                                                                                | 1366                                                                                | 1433                                                                                | 1169                                                                                | 2267                                                                                | 1014                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 47.2                                                                              | 0.0                                                                               | 0.0                                                                               | 47.6                                                                              | 0.0                                                                               | 0.0                                                                               | 31.6                                                                                | 3.9                                                                                 | 3.9                                                                                 | 53.6                                                                                | 28.5                                                                                | 20.5                                                                                |
| Incr Delay (d2), s/veh       | 1.3                                                                               | 0.0                                                                               | 0.0                                                                               | 1.8                                                                               | 0.0                                                                               | 0.0                                                                               | 6.8                                                                                 | 0.4                                                                                 | 0.3                                                                                 | 42.0                                                                                | 1.7                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 2.5                                                                               | 0.0                                                                               | 0.0                                                                               | 3.1                                                                               | 0.0                                                                               | 0.0                                                                               | 20.1                                                                                | 4.7                                                                                 | 5.0                                                                                 | 0.2                                                                                 | 13.1                                                                                | 0.1                                                                                 |
| LnGrp Delay(d),s/veh         | 48.5                                                                              | 0.0                                                                               | 0.0                                                                               | 49.4                                                                              | 0.0                                                                               | 0.0                                                                               | 38.4                                                                                | 4.3                                                                                 | 4.2                                                                                 | 95.5                                                                                | 30.2                                                                                | 20.6                                                                                |
| LnGrp LOS                    | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                   | A                                                                                   | A                                                                                   | F                                                                                   | C                                                                                   | C                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 87                                                                                |                                                                                   |                                                                                   | 107                                                                               |                                                                                   |                                                                                     | 1685                                                                                |                                                                                     |                                                                                     | 1011                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 48.5                                                                              |                                                                                   |                                                                                   | 49.4                                                                              |                                                                                   |                                                                                     | 17.6                                                                                |                                                                                     |                                                                                     | 30.5                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 46.3                                                                              | 47.3                                                                              |                                                                                   | 14.1                                                                              | 4.4                                                                               | 89.2                                                                              |                                                                                     | 14.1                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 71.0                                                                              | 69.0                                                                              |                                                                                   | 25.0                                                                              | 71.0                                                                              | 69.0                                                                              |                                                                                     | 20.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 40.6                                                                              | 28.2                                                                              |                                                                                   | 8.4                                                                               | 2.3                                                                               | 11.7                                                                              |                                                                                     | 7.6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 1.7                                                                               | 13.2                                                                              |                                                                                   | 0.3                                                                               | 0.0                                                                               | 13.4                                                                              |                                                                                     | 0.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 24.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 5: Honoapiilani Highway & Halawai Drive

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 50                                                                                | 5                                                                                 | 140                                                                               | 15                                                                                | 0                                                                                 | 5                                                                                 | 135                                                                                 | 1490                                                                                | 10                                                                                  | 10                                                                                  | 1610                                                                                | 60                                                                                  |
| Future Volume (veh/h)        | 50                                                                                | 5                                                                                 | 140                                                                               | 15                                                                                | 0                                                                                 | 5                                                                                 | 135                                                                                 | 1490                                                                                | 10                                                                                  | 10                                                                                  | 1610                                                                                | 60                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.97                                                                              |                                                                                   | 0.96                                                                              | 0.97                                                                              |                                                                                   | 0.96                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 54                                                                                | 5                                                                                 | 5                                                                                 | 16                                                                                | 0                                                                                 | 1                                                                                 | 147                                                                                 | 1620                                                                                | 11                                                                                  | 11                                                                                  | 1750                                                                                | 40                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 221                                                                               | 17                                                                                | 170                                                                               | 178                                                                               | 2                                                                                 | 7                                                                                 | 178                                                                                 | 2663                                                                                | 18                                                                                  | 14                                                                                  | 2288                                                                                | 1024                                                                                |
| Arrive On Green              | 0.12                                                                              | 0.11                                                                              | 0.11                                                                              | 0.12                                                                              | 0.00                                                                              | 0.11                                                                              | 0.10                                                                                | 0.74                                                                                | 0.74                                                                                | 0.01                                                                                | 0.65                                                                                | 0.65                                                                                |
| Sat Flow, veh/h              | 1357                                                                              | 154                                                                               | 1520                                                                              | 959                                                                               | 18                                                                                | 61                                                                                | 1774                                                                                | 3603                                                                                | 24                                                                                  | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 59                                                                                | 0                                                                                 | 5                                                                                 | 17                                                                                | 0                                                                                 | 0                                                                                 | 147                                                                                 | 795                                                                                 | 836                                                                                 | 11                                                                                  | 1750                                                                                | 40                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1511                                                                              | 0                                                                                 | 1520                                                                              | 1037                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1858                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.3                                                                               | 1.0                                                                               | 0.0                                                                               | 0.0                                                                               | 8.1                                                                                 | 21.1                                                                                | 21.2                                                                                | 0.6                                                                                 | 34.3                                                                                | 0.9                                                                                 |
| Cycle Q Clear(g_c), s        | 3.1                                                                               | 0.0                                                                               | 0.3                                                                               | 4.0                                                                               | 0.0                                                                               | 0.0                                                                               | 8.1                                                                                 | 21.1                                                                                | 21.2                                                                                | 0.6                                                                                 | 34.3                                                                                | 0.9                                                                                 |
| Prop In Lane                 | 0.92                                                                              |                                                                                   | 1.00                                                                              | 0.94                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                                |                                                                                     | 0.01                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 254                                                                               | 0                                                                                 | 170                                                                               | 197                                                                               | 0                                                                                 | 0                                                                                 | 178                                                                                 | 1308                                                                                | 1373                                                                                | 14                                                                                  | 2288                                                                                | 1024                                                                                |
| V/C Ratio(X)                 | 0.23                                                                              | 0.00                                                                              | 0.03                                                                              | 0.09                                                                              | 0.00                                                                              | 0.00                                                                              | 0.82                                                                                | 0.61                                                                                | 0.61                                                                                | 0.78                                                                                | 0.76                                                                                | 0.04                                                                                |
| Avail Cap(c_a), veh/h        | 421                                                                               | 0                                                                                 | 352                                                                               | 360                                                                               | 0                                                                                 | 0                                                                                 | 375                                                                                 | 1533                                                                                | 1610                                                                                | 197                                                                                 | 2710                                                                                | 1212                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 40.1                                                                              | 0.0                                                                               | 39.3                                                                              | 41.4                                                                              | 0.0                                                                               | 0.0                                                                               | 43.8                                                                                | 6.1                                                                                 | 6.1                                                                                 | 49.1                                                                                | 12.3                                                                                | 6.4                                                                                 |
| Incr Delay (d2), s/veh       | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 3.6                                                                                 | 1.0                                                                                 | 1.0                                                                                 | 28.8                                                                                | 1.6                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.5                                                                               | 0.0                                                                               | 0.1                                                                               | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 4.1                                                                                 | 10.5                                                                                | 11.1                                                                                | 0.4                                                                                 | 17.0                                                                                | 0.4                                                                                 |
| LnGrp Delay(d),s/veh         | 40.2                                                                              | 0.0                                                                               | 39.3                                                                              | 41.5                                                                              | 0.0                                                                               | 0.0                                                                               | 47.4                                                                                | 7.2                                                                                 | 7.1                                                                                 | 77.9                                                                                | 13.8                                                                                | 6.4                                                                                 |
| LnGrp LOS                    | D                                                                                 |                                                                                   | D                                                                                 | D                                                                                 |                                                                                   |                                                                                   | D                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 64                                                                                |                                                                                   |                                                                                   | 17                                                                                |                                                                                   |                                                                                     | 1778                                                                                |                                                                                     |                                                                                     | 1801                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 40.2                                                                              |                                                                                   |                                                                                   | 41.5                                                                              |                                                                                   |                                                                                     | 10.5                                                                                |                                                                                     |                                                                                     | 14.1                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 14.0                                                                              | 69.2                                                                              |                                                                                   | 16.1                                                                              | 4.8                                                                               | 78.4                                                                              |                                                                                     | 16.1                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 21.0                                                                              | 76.0                                                                              |                                                                                   | 23.0                                                                              | 11.0                                                                              | 86.0                                                                              |                                                                                     | 23.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 10.1                                                                              | 36.3                                                                              |                                                                                   | 6.0                                                                               | 2.6                                                                               | 23.2                                                                              |                                                                                     | 5.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.1                                                                               | 27.9                                                                              |                                                                                   | 0.0                                                                               | 0.0                                                                               | 31.6                                                                              |                                                                                     | 0.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 12.9                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 6: Honoapiilani Highway & Kai Ala Drive/Puukolii Road

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 75                                                                                | 5                                                                                 | 175                                                                               | 70                                                                                | 5                                                                                 | 45                                                                                | 125                                                                                 | 1510                                                                                | 60                                                                                  | 35                                                                                  | 1770                                                                                | 95                                                                                  |
| Future Volume (veh/h)        | 75                                                                                | 5                                                                                 | 175                                                                               | 70                                                                                | 5                                                                                 | 45                                                                                | 125                                                                                 | 1510                                                                                | 60                                                                                  | 35                                                                                  | 1770                                                                                | 95                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.99                                                                              | 0.99                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 82                                                                                | 5                                                                                 | 27                                                                                | 76                                                                                | 5                                                                                 | 1                                                                                 | 136                                                                                 | 1641                                                                                | 49                                                                                  | 38                                                                                  | 1924                                                                                | 81                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 212                                                                               | 12                                                                                | 205                                                                               | 142                                                                               | 197                                                                               | 39                                                                                | 157                                                                                 | 2656                                                                                | 1187                                                                                | 49                                                                                  | 2440                                                                                | 1091                                                                                |
| Arrive On Green              | 0.14                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.09                                                                                | 0.75                                                                                | 0.75                                                                                | 0.03                                                                                | 0.69                                                                                | 0.69                                                                                |
| Sat Flow, veh/h              | 1298                                                                              | 89                                                                                | 1562                                                                              | 1358                                                                              | 1504                                                                              | 301                                                                               | 1774                                                                                | 3539                                                                                | 1582                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 87                                                                                | 0                                                                                 | 27                                                                                | 76                                                                                | 0                                                                                 | 6                                                                                 | 136                                                                                 | 1641                                                                                | 49                                                                                  | 38                                                                                  | 1924                                                                                | 81                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1387                                                                              | 0                                                                                 | 1562                                                                              | 1358                                                                              | 0                                                                                 | 1805                                                                              | 1774                                                                                | 1770                                                                                | 1582                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 9.2                                                                               | 0.0                                                                               | 2.5                                                                               | 9.1                                                                               | 0.0                                                                               | 0.5                                                                               | 12.5                                                                                | 35.6                                                                                | 1.3                                                                                 | 3.5                                                                                 | 61.1                                                                                | 2.8                                                                                 |
| Cycle Q Clear(g_c), s        | 9.7                                                                               | 0.0                                                                               | 2.5                                                                               | 18.8                                                                              | 0.0                                                                               | 0.5                                                                               | 12.5                                                                                | 35.6                                                                                | 1.3                                                                                 | 3.5                                                                                 | 61.1                                                                                | 2.8                                                                                 |
| Prop In Lane                 | 0.94                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.17                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 233                                                                               | 0                                                                                 | 205                                                                               | 142                                                                               | 0                                                                                 | 237                                                                               | 157                                                                                 | 2656                                                                                | 1187                                                                                | 49                                                                                  | 2440                                                                                | 1091                                                                                |
| V/C Ratio(X)                 | 0.37                                                                              | 0.00                                                                              | 0.13                                                                              | 0.54                                                                              | 0.00                                                                              | 0.03                                                                              | 0.86                                                                                | 0.62                                                                                | 0.04                                                                                | 0.78                                                                                | 0.79                                                                                | 0.07                                                                                |
| Avail Cap(c_a), veh/h        | 253                                                                               | 0                                                                                 | 227                                                                               | 161                                                                               | 0                                                                                 | 263                                                                               | 280                                                                                 | 2656                                                                                | 1187                                                                                | 108                                                                                 | 2440                                                                                | 1091                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.68                                                                                | 0.68                                                                                | 0.68                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 66.2                                                                              | 0.0                                                                               | 63.4                                                                              | 75.2                                                                              | 0.0                                                                               | 62.5                                                                              | 74.2                                                                                | 9.6                                                                                 | 5.3                                                                                 | 79.7                                                                                | 17.4                                                                                | 8.4                                                                                 |
| Incr Delay (d2), s/veh       | 1.0                                                                               | 0.0                                                                               | 0.3                                                                               | 3.1                                                                               | 0.0                                                                               | 0.0                                                                               | 3.7                                                                                 | 0.7                                                                                 | 0.0                                                                                 | 9.3                                                                                 | 2.7                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 3.7                                                                               | 0.0                                                                               | 1.1                                                                               | 3.5                                                                               | 0.0                                                                               | 0.2                                                                               | 6.3                                                                                 | 17.4                                                                                | 0.6                                                                                 | 1.8                                                                                 | 30.6                                                                                | 1.3                                                                                 |
| LnGrp Delay(d),s/veh         | 67.2                                                                              | 0.0                                                                               | 63.7                                                                              | 78.4                                                                              | 0.0                                                                               | 62.5                                                                              | 77.9                                                                                | 10.3                                                                                | 5.3                                                                                 | 89.0                                                                                | 20.1                                                                                | 8.5                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                   | B                                                                                   | A                                                                                   | F                                                                                   | C                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 114                                                                               |                                                                                   |                                                                                   | 82                                                                                |                                                                                   |                                                                                     | 1826                                                                                |                                                                                     |                                                                                     | 2043                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 66.4                                                                              |                                                                                   |                                                                                   | 77.2                                                                              |                                                                                   |                                                                                     | 15.2                                                                                |                                                                                     |                                                                                     | 20.9                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 18.6                                                                              | 119.7                                                                             |                                                                                   | 26.6                                                                              | 8.6                                                                               | 129.8                                                                             |                                                                                     | 26.6                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 26.0                                                                              | 100.0                                                                             |                                                                                   | 24.0                                                                              | 10.0                                                                              | 116.0                                                                             |                                                                                     | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 14.5                                                                              | 63.1                                                                              |                                                                                   | 20.8                                                                              | 5.5                                                                               | 37.6                                                                              |                                                                                     | 11.7                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.2                                                                               | 29.3                                                                              |                                                                                   | 0.1                                                                               | 0.0                                                                               | 37.8                                                                              |                                                                                     | 0.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 20.8                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 7: Honoapiilani Highway & Kaanapali Parkway/Halelo Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |  |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 350                                                                               | 5                                                                                 | 740                                                                               | 15                                                                                | 0                                                                                 | 5                                                                                 | 500                                                                                | 1505                                                                                | 10                                                                                  | 75                                                                                  | 1760                                                                                | 190                                                                                 |
| Future Volume (veh/h)        | 350                                                                               | 5                                                                                 | 740                                                                               | 15                                                                                | 0                                                                                 | 5                                                                                 | 500                                                                                | 1505                                                                                | 10                                                                                  | 75                                                                                  | 1760                                                                                | 190                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                              |                                                                                   | 0.96                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 384                                                                               | 0                                                                                 | 609                                                                               | 16                                                                                | 0                                                                                 | 1                                                                                 | 543                                                                                | 1636                                                                                | 11                                                                                  | 82                                                                                  | 1913                                                                                | 177                                                                                 |
| Adj No. of Lanes             | 2                                                                                 | 0                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 2                                                                                  | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 487                                                                               | 0                                                                                 | 973                                                                               | 64                                                                                | 0                                                                                 | 4                                                                                 | 606                                                                                | 2517                                                                                | 17                                                                                  | 107                                                                                 | 2063                                                                                | 1134                                                                                |
| Arrive On Green              | 0.14                                                                              | 0.00                                                                              | 0.13                                                                              | 0.04                                                                              | 0.00                                                                              | 0.03                                                                              | 0.18                                                                               | 0.70                                                                                | 0.69                                                                                | 0.06                                                                                | 0.58                                                                                | 0.58                                                                                |
| Sat Flow, veh/h              | 3548                                                                              | 0                                                                                 | 3119                                                                              | 1653                                                                              | 0                                                                                 | 103                                                                               | 3442                                                                               | 3604                                                                                | 24                                                                                  | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 384                                                                               | 0                                                                                 | 609                                                                               | 17                                                                                | 0                                                                                 | 0                                                                                 | 543                                                                                | 803                                                                                 | 844                                                                                 | 82                                                                                  | 1913                                                                                | 177                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1774                                                                              | 0                                                                                 | 1560                                                                              | 1756                                                                              | 0                                                                                 | 0                                                                                 | 1721                                                                               | 1770                                                                                | 1858                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 25.9                                                                              | 0.0                                                                               | 33.0                                                                              | 2.3                                                                               | 0.0                                                                               | 0.0                                                                               | 38.2                                                                               | 62.0                                                                                | 62.2                                                                                | 11.3                                                                                | 121.5                                                                               | 8.8                                                                                 |
| Cycle Q Clear(g_c), s        | 25.9                                                                              | 0.0                                                                               | 33.0                                                                              | 2.3                                                                               | 0.0                                                                               | 0.0                                                                               | 38.2                                                                               | 62.0                                                                                | 62.2                                                                                | 11.3                                                                                | 121.5                                                                               | 8.8                                                                                 |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.94                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                               |                                                                                     | 0.01                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 487                                                                               | 0                                                                                 | 973                                                                               | 69                                                                                | 0                                                                                 | 0                                                                                 | 606                                                                                | 1236                                                                                | 1298                                                                                | 107                                                                                 | 2063                                                                                | 1134                                                                                |
| V/C Ratio(X)                 | 0.79                                                                              | 0.00                                                                              | 0.63                                                                              | 0.25                                                                              | 0.00                                                                              | 0.00                                                                              | 0.90                                                                               | 0.65                                                                                | 0.65                                                                                | 0.76                                                                                | 0.93                                                                                | 0.16                                                                                |
| Avail Cap(c_a), veh/h        | 487                                                                               | 0                                                                                 | 973                                                                               | 220                                                                               | 0                                                                                 | 0                                                                                 | 806                                                                                | 1386                                                                                | 1456                                                                                | 107                                                                                 | 2158                                                                                | 1176                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 103.3                                                                             | 0.0                                                                               | 73.4                                                                              | 115.6                                                                             | 0.0                                                                               | 0.0                                                                               | 99.8                                                                               | 20.6                                                                                | 20.6                                                                                | 114.6                                                                               | 46.9                                                                                | 11.2                                                                                |
| Incr Delay (d2), s/veh       | 7.8                                                                               | 0.0                                                                               | 1.0                                                                               | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 8.6                                                                                | 1.1                                                                                 | 1.1                                                                                 | 24.7                                                                                | 7.6                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 13.3                                                                              | 0.0                                                                               | 18.1                                                                              | 1.1                                                                               | 0.0                                                                               | 0.0                                                                               | 19.0                                                                               | 30.5                                                                                | 32.3                                                                                | 6.3                                                                                 | 61.4                                                                                | 5.7                                                                                 |
| LnGrp Delay(d),s/veh         | 111.1                                                                             | 0.0                                                                               | 74.3                                                                              | 116.3                                                                             | 0.0                                                                               | 0.0                                                                               | 108.4                                                                              | 21.7                                                                                | 21.7                                                                                | 139.3                                                                               | 54.5                                                                                | 11.3                                                                                |
| LnGrp LOS                    | F                                                                                 |                                                                                   | E                                                                                 | F                                                                                 |                                                                                   |                                                                                   | F                                                                                  | C                                                                                   | C                                                                                   | F                                                                                   | D                                                                                   | B                                                                                   |
| Approach Vol, veh/h          | 993                                                                               |                                                                                   |                                                                                   |                                                                                   | 17                                                                                |                                                                                   |                                                                                    | 2190                                                                                |                                                                                     |                                                                                     | 2172                                                                                |                                                                                     |
| Approach Delay, s/veh        | 88.6                                                                              |                                                                                   |                                                                                   |                                                                                   | 116.3                                                                             |                                                                                   |                                                                                    | 43.2                                                                                |                                                                                     |                                                                                     | 54.2                                                                                |                                                                                     |
| Approach LOS                 | F                                                                                 |                                                                                   |                                                                                   |                                                                                   | F                                                                                 |                                                                                   |                                                                                    | D                                                                                   |                                                                                     |                                                                                     | D                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 47.6                                                                              | 148.4                                                                             |                                                                                   | 13.7                                                                              | 19.0                                                                              | 177.0                                                                             |                                                                                    | 38.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 6.0                                                                               | 6.0                                                                               |                                                                                   | 7.0                                                                               | 6.0                                                                               | 6.0                                                                               |                                                                                    | 7.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 56.0                                                                              | 149.0                                                                             |                                                                                   | 28.0                                                                              | 13.0                                                                              | 192.0                                                                             |                                                                                    | 31.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 40.2                                                                              | 123.5                                                                             |                                                                                   | 4.3                                                                               | 13.3                                                                              | 64.2                                                                              |                                                                                    | 35.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 1.4                                                                               | 18.9                                                                              |                                                                                   | 0.0                                                                               | 0.0                                                                               | 22.8                                                                              |                                                                                    | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          | 56.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 | E                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 8: Honoapiilani Highway & Leialii Parkway

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 10                                                                                | 0                                                                                 | 5                                                                                 | 90                                                                                | 5                                                                                 | 60                                                                                | 10                                                                                  | 1975                                                                                | 90                                                                                  | 85                                                                                  | 2465                                                                                | 5                                                                                   |
| Future Volume (veh/h)        | 10                                                                                | 0                                                                                 | 5                                                                                 | 90                                                                                | 5                                                                                 | 60                                                                                | 10                                                                                  | 1975                                                                                | 90                                                                                  | 85                                                                                  | 2465                                                                                | 5                                                                                   |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 11                                                                                | 0                                                                                 | 1                                                                                 | 98                                                                                | 5                                                                                 | 3                                                                                 | 11                                                                                  | 2147                                                                                | 96                                                                                  | 92                                                                                  | 2679                                                                                | 5                                                                                   |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 160                                                                               | 2                                                                                 | 10                                                                                | 182                                                                               | 96                                                                                | 58                                                                                | 18                                                                                  | 2611                                                                                | 116                                                                                 | 118                                                                                 | 2946                                                                                | 5                                                                                   |
| Arrive On Green              | 0.09                                                                              | 0.00                                                                              | 0.08                                                                              | 0.09                                                                              | 0.09                                                                              | 0.08                                                                              | 0.01                                                                                | 1.00                                                                                | 1.00                                                                                | 0.07                                                                                | 0.81                                                                                | 0.81                                                                                |
| Sat Flow, veh/h              | 1235                                                                              | 26                                                                                | 115                                                                               | 1410                                                                              | 1092                                                                              | 655                                                                               | 1774                                                                                | 3452                                                                                | 153                                                                                 | 1774                                                                                | 3624                                                                                | 7                                                                                   |
| Grp Volume(v), veh/h         | 12                                                                                | 0                                                                                 | 0                                                                                 | 98                                                                                | 0                                                                                 | 8                                                                                 | 11                                                                                  | 1093                                                                                | 1150                                                                                | 92                                                                                  | 1308                                                                                | 1376                                                                                |
| Grp Sat Flow(s),veh/h/ln     | 1376                                                                              | 0                                                                                 | 0                                                                                 | 1410                                                                              | 0                                                                                 | 1747                                                                              | 1774                                                                                | 1770                                                                                | 1836                                                                                | 1774                                                                                | 1770                                                                                | 1862                                                                                |
| Q Serve(g_s), s              | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 7.4                                                                               | 0.0                                                                               | 0.6                                                                               | 0.8                                                                                 | 0.0                                                                                 | 0.2                                                                                 | 6.9                                                                                 | 71.5                                                                                | 71.7                                                                                |
| Cycle Q Clear(g_c), s        | 1.4                                                                               | 0.0                                                                               | 0.0                                                                               | 8.8                                                                               | 0.0                                                                               | 0.6                                                                               | 0.8                                                                                 | 0.0                                                                                 | 0.2                                                                                 | 6.9                                                                                 | 71.5                                                                                | 71.7                                                                                |
| Prop In Lane                 | 0.92                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                              |                                                                                   | 0.38                                                                              | 1.00                                                                                |                                                                                     | 0.08                                                                                | 1.00                                                                                |                                                                                     | 0.00                                                                                |
| Lane Grp Cap(c), veh/h       | 173                                                                               | 0                                                                                 | 0                                                                                 | 182                                                                               | 0                                                                                 | 154                                                                               | 18                                                                                  | 1338                                                                                | 1388                                                                                | 118                                                                                 | 1438                                                                                | 1513                                                                                |
| V/C Ratio(X)                 | 0.07                                                                              | 0.00                                                                              | 0.00                                                                              | 0.54                                                                              | 0.00                                                                              | 0.05                                                                              | 0.62                                                                                | 0.82                                                                                | 0.83                                                                                | 0.78                                                                                | 0.91                                                                                | 0.91                                                                                |
| Avail Cap(c_a), veh/h        | 299                                                                               | 0                                                                                 | 0                                                                                 | 308                                                                               | 0                                                                                 | 311                                                                               | 145                                                                                 | 1338                                                                                | 1388                                                                                | 250                                                                                 | 1438                                                                                | 1513                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.33                                                                                | 1.33                                                                                | 1.33                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.49                                                                                | 0.49                                                                                | 0.49                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 56.9                                                                              | 0.0                                                                               | 0.0                                                                               | 60.0                                                                              | 0.0                                                                               | 56.5                                                                              | 66.3                                                                                | 0.0                                                                                 | 0.0                                                                                 | 62.0                                                                                | 9.1                                                                                 | 9.1                                                                                 |
| Incr Delay (d2), s/veh       | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 2.5                                                                               | 0.0                                                                               | 0.1                                                                               | 6.2                                                                                 | 2.8                                                                                 | 2.9                                                                                 | 4.1                                                                                 | 10.0                                                                                | 9.7                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 3.7                                                                               | 0.0                                                                               | 0.3                                                                               | 0.4                                                                                 | 1.0                                                                                 | 1.1                                                                                 | 3.5                                                                                 | 38.2                                                                                | 40.0                                                                                |
| LnGrp Delay(d),s/veh         | 57.0                                                                              | 0.0                                                                               | 0.0                                                                               | 62.5                                                                              | 0.0                                                                               | 56.7                                                                              | 72.5                                                                                | 2.8                                                                                 | 2.9                                                                                 | 66.2                                                                                | 19.1                                                                                | 18.8                                                                                |
| LnGrp LOS                    | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 12                                                                                |                                                                                   |                                                                                   | 106                                                                               |                                                                                   |                                                                                     | 2254                                                                                |                                                                                     |                                                                                     | 2776                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 57.0                                                                              |                                                                                   |                                                                                   | 62.0                                                                              |                                                                                   |                                                                                     | 3.2                                                                                 |                                                                                     |                                                                                     | 20.5                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.4                                                                               | 113.7                                                                             |                                                                                   | 15.9                                                                              | 13.0                                                                              | 106.1                                                                             |                                                                                     | 15.9                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 11.0                                                                              | 87.0                                                                              |                                                                                   | 23.0                                                                              | 19.0                                                                              | 79.0                                                                              |                                                                                     | 23.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.8                                                                               | 73.7                                                                              |                                                                                   | 10.8                                                                              | 8.9                                                                               | 2.2                                                                               |                                                                                     | 3.4                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 13.2                                                                              |                                                                                   | 0.2                                                                               | 0.1                                                                               | 61.9                                                                              |                                                                                     | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   |                                                                                   | 13.9                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 9: Honoapiilani Highway & Front Street/Flemming Road

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |                                                                                   |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 175                                                                               | 15                                                                                | 10                                                                                | 60                                                                                | 5                                                                                 | 10                                                                                | 5                                                                                   | 1900                                                                                | 20                                                                                  | 5                                                                                   | 2115                                                                                | 325                                                                                 |
| Future Volume (veh/h)        | 175                                                                               | 15                                                                                | 10                                                                                | 60                                                                                | 5                                                                                 | 10                                                                                | 5                                                                                   | 1900                                                                                | 20                                                                                  | 5                                                                                   | 2115                                                                                | 325                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 190                                                                               | 16                                                                                | 9                                                                                 | 65                                                                                | 5                                                                                 | 7                                                                                 | 5                                                                                   | 2065                                                                                | 22                                                                                  | 5                                                                                   | 2299                                                                                | 285                                                                                 |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 0                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 268                                                                               | 18                                                                                | 10                                                                                | 273                                                                               | 22                                                                                | 25                                                                                | 7                                                                                   | 2663                                                                                | 28                                                                                  | 7                                                                                   | 2627                                                                                | 1175                                                                                |
| Arrive On Green              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.01                                                                                | 1.00                                                                                | 1.00                                                                                | 0.00                                                                                | 0.74                                                                                | 0.74                                                                                |
| Sat Flow, veh/h              | 1321                                                                              | 111                                                                               | 63                                                                                | 1358                                                                              | 132                                                                               | 149                                                                               | 1774                                                                                | 3587                                                                                | 38                                                                                  | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 215                                                                               | 0                                                                                 | 0                                                                                 | 77                                                                                | 0                                                                                 | 0                                                                                 | 5                                                                                   | 1017                                                                                | 1070                                                                                | 5                                                                                   | 2299                                                                                | 285                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1495                                                                              | 0                                                                                 | 0                                                                                 | 1639                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1856                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 13.4                                                                              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.4                                                                                 | 64.5                                                                                | 7.6                                                                                 |
| Cycle Q Clear(g_c), s        | 18.8                                                                              | 0.0                                                                               | 0.0                                                                               | 5.4                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.4                                                                                 | 64.5                                                                                | 7.6                                                                                 |
| Prop In Lane                 | 0.88                                                                              |                                                                                   | 0.04                                                                              | 0.84                                                                              |                                                                                   | 0.09                                                                              | 1.00                                                                                |                                                                                     | 0.02                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 297                                                                               | 0                                                                                 | 0                                                                                 | 319                                                                               | 0                                                                                 | 0                                                                                 | 7                                                                                   | 1314                                                                                | 1378                                                                                | 7                                                                                   | 2627                                                                                | 1175                                                                                |
| V/C Ratio(X)                 | 0.72                                                                              | 0.00                                                                              | 0.00                                                                              | 0.24                                                                              | 0.00                                                                              | 0.00                                                                              | 0.74                                                                                | 0.77                                                                                | 0.78                                                                                | 0.74                                                                                | 0.87                                                                                | 0.24                                                                                |
| Avail Cap(c_a), veh/h        | 379                                                                               | 0                                                                                 | 0                                                                                 | 401                                                                               | 0                                                                                 | 0                                                                                 | 105                                                                                 | 1314                                                                                | 1378                                                                                | 105                                                                                 | 2627                                                                                | 1175                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.54                                                                                | 0.54                                                                                | 0.54                                                                                | 0.22                                                                                | 0.22                                                                                | 0.22                                                                                |
| Uniform Delay (d), s/veh     | 54.6                                                                              | 0.0                                                                               | 0.0                                                                               | 49.4                                                                              | 0.0                                                                               | 0.0                                                                               | 66.9                                                                                | 0.0                                                                                 | 0.0                                                                                 | 67.2                                                                                | 12.8                                                                                | 5.5                                                                                 |
| Incr Delay (d2), s/veh       | 4.9                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 26.8                                                                                | 2.5                                                                                 | 2.4                                                                                 | 12.2                                                                                | 1.0                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 8.2                                                                               | 0.0                                                                               | 0.0                                                                               | 2.6                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                                 | 0.9                                                                                 | 0.9                                                                                 | 0.2                                                                                 | 31.4                                                                                | 3.4                                                                                 |
| LnGrp Delay(d),s/veh         | 59.5                                                                              | 0.0                                                                               | 0.0                                                                               | 49.7                                                                              | 0.0                                                                               | 0.0                                                                               | 93.8                                                                                | 2.5                                                                                 | 2.4                                                                                 | 79.4                                                                                | 13.8                                                                                | 5.6                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | F                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 215                                                                               |                                                                                   |                                                                                   | 77                                                                                |                                                                                   |                                                                                     | 2092                                                                                |                                                                                     |                                                                                     | 2589                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 59.5                                                                              |                                                                                   |                                                                                   | 49.7                                                                              |                                                                                   |                                                                                     | 2.6                                                                                 |                                                                                     |                                                                                     | 13.0                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 4.5                                                                               | 104.2                                                                             |                                                                                   | 26.3                                                                              | 4.5                                                                               | 104.2                                                                             |                                                                                     | 26.3                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 8.0                                                                               | 84.0                                                                              |                                                                                   | 29.0                                                                              | 8.0                                                                               | 84.0                                                                              |                                                                                     | 29.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.4                                                                               | 66.5                                                                              |                                                                                   | 7.4                                                                               | 2.4                                                                               | 2.0                                                                               |                                                                                     | 20.8                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 17.2                                                                              |                                                                                   | 0.2                                                                               | 0.0                                                                               | 69.9                                                                              |                                                                                     | 0.5                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   |                                                                                   | 11.2                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 10: Honoapiilani Highway & Kapunakea Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |                                                                                     |  |  |                                                                                     |
| Traffic Volume (veh/h)       | 180                                                                               | 35                                                                                | 45                                                                                | 95                                                                                | 25                                                                                | 20                                                                                | 55                                                                                 | 1700                                                                                | 105                                                                                 | 25                                                                                  | 2050                                                                                | 150                                                                                 |
| Future Volume (veh/h)        | 180                                                                               | 35                                                                                | 45                                                                                | 95                                                                                | 25                                                                                | 20                                                                                | 55                                                                                 | 1700                                                                                | 105                                                                                 | 25                                                                                  | 2050                                                                                | 150                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                              |                                                                                   | 0.97                                                                              | 0.99                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 196                                                                               | 38                                                                                | 7                                                                                 | 103                                                                               | 27                                                                                | 2                                                                                 | 60                                                                                 | 1848                                                                                | 111                                                                                 | 27                                                                                  | 2228                                                                                | 159                                                                                 |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 252                                                                               | 39                                                                                | 286                                                                               | 337                                                                               | 317                                                                               | 23                                                                                | 76                                                                                 | 2399                                                                                | 143                                                                                 | 34                                                                                  | 2290                                                                                | 161                                                                                 |
| Arrive On Green              | 0.19                                                                              | 0.19                                                                              | 0.19                                                                              | 0.19                                                                              | 0.19                                                                              | 0.18                                                                              | 0.09                                                                               | 1.00                                                                                | 1.00                                                                                | 0.03                                                                                | 0.91                                                                                | 0.90                                                                                |
| Sat Flow, veh/h              | 1095                                                                              | 212                                                                               | 1542                                                                              | 1347                                                                              | 1710                                                                              | 127                                                                               | 1774                                                                               | 3395                                                                                | 202                                                                                 | 1774                                                                                | 3353                                                                                | 236                                                                                 |
| Grp Volume(v), veh/h         | 234                                                                               | 0                                                                                 | 7                                                                                 | 103                                                                               | 0                                                                                 | 29                                                                                | 60                                                                                 | 954                                                                                 | 1005                                                                                | 27                                                                                  | 1163                                                                                | 1224                                                                                |
| Grp Sat Flow(s),veh/h/ln     | 1307                                                                              | 0                                                                                 | 1542                                                                              | 1347                                                                              | 0                                                                                 | 1836                                                                              | 1774                                                                               | 1770                                                                                | 1827                                                                                | 1774                                                                                | 1770                                                                                | 1820                                                                                |
| Q Serve(g_s), s              | 22.3                                                                              | 0.0                                                                               | 0.5                                                                               | 0.0                                                                               | 0.0                                                                               | 1.8                                                                               | 4.5                                                                                | 0.0                                                                                 | 0.0                                                                                 | 2.0                                                                                 | 64.5                                                                                | 78.9                                                                                |
| Cycle Q Clear(g_c), s        | 24.1                                                                              | 0.0                                                                               | 0.5                                                                               | 7.9                                                                               | 0.0                                                                               | 1.8                                                                               | 4.5                                                                                | 0.0                                                                                 | 0.0                                                                                 | 2.0                                                                                 | 64.5                                                                                | 78.9                                                                                |
| Prop In Lane                 | 0.84                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.07                                                                              | 1.00                                                                               |                                                                                     | 0.11                                                                                | 1.00                                                                                |                                                                                     | 0.13                                                                                |
| Lane Grp Cap(c), veh/h       | 291                                                                               | 0                                                                                 | 286                                                                               | 337                                                                               | 0                                                                                 | 340                                                                               | 76                                                                                 | 1251                                                                                | 1291                                                                                | 34                                                                                  | 1209                                                                                | 1243                                                                                |
| V/C Ratio(X)                 | 0.80                                                                              | 0.00                                                                              | 0.02                                                                              | 0.31                                                                              | 0.00                                                                              | 0.09                                                                              | 0.79                                                                               | 0.76                                                                                | 0.78                                                                                | 0.80                                                                                | 0.96                                                                                | 0.98                                                                                |
| Avail Cap(c_a), veh/h        | 291                                                                               | 0                                                                                 | 286                                                                               | 337                                                                               | 0                                                                                 | 340                                                                               | 79                                                                                 | 1251                                                                                | 1291                                                                                | 53                                                                                  | 1209                                                                                | 1243                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 2.00                                                                               | 2.00                                                                                | 2.00                                                                                | 1.33                                                                                | 1.33                                                                                | 1.33                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.26                                                                               | 0.26                                                                                | 0.26                                                                                | 0.34                                                                                | 0.34                                                                                | 0.34                                                                                |
| Uniform Delay (d), s/veh     | 55.5                                                                              | 0.0                                                                               | 45.0                                                                              | 48.0                                                                              | 0.0                                                                               | 45.6                                                                              | 61.1                                                                               | 0.0                                                                                 | 0.0                                                                                 | 65.5                                                                                | 4.9                                                                                 | 5.7                                                                                 |
| Incr Delay (d2), s/veh       | 15.0                                                                              | 0.0                                                                               | 0.0                                                                               | 0.5                                                                               | 0.0                                                                               | 0.1                                                                               | 11.4                                                                               | 1.2                                                                                 | 1.2                                                                                 | 6.9                                                                                 | 8.5                                                                                 | 11.6                                                                                |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 9.9                                                                               | 0.0                                                                               | 0.2                                                                               | 3.4                                                                               | 0.0                                                                               | 0.9                                                                               | 2.4                                                                                | 0.4                                                                                 | 0.4                                                                                 | 1.1                                                                                 | 31.4                                                                                | 40.0                                                                                |
| LnGrp Delay(d),s/veh         | 70.5                                                                              | 0.0                                                                               | 45.1                                                                              | 48.5                                                                              | 0.0                                                                               | 45.7                                                                              | 72.5                                                                               | 1.2                                                                                 | 1.2                                                                                 | 72.5                                                                                | 13.4                                                                                | 17.3                                                                                |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 |                                                                                   | D                                                                                 | E                                                                                  | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 241                                                                               |                                                                                   |                                                                                   | 132                                                                               |                                                                                   |                                                                                    | 2019                                                                                |                                                                                     |                                                                                     | 2414                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 69.8                                                                              |                                                                                   |                                                                                   | 47.9                                                                              |                                                                                   |                                                                                    | 3.3                                                                                 |                                                                                     |                                                                                     | 16.0                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                    | A                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 9.8                                                                               | 96.2                                                                              |                                                                                   | 29.0                                                                              | 6.6                                                                               | 99.4                                                                              |                                                                                    | 29.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 6.0                                                                               | 91.0                                                                              |                                                                                   | 24.0                                                                              | 4.0                                                                               | 93.0                                                                              |                                                                                    | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 6.5                                                                               | 80.9                                                                              |                                                                                   | 9.9                                                                               | 4.0                                                                               | 2.0                                                                               |                                                                                    | 26.1                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 9.8                                                                               |                                                                                   | 0.4                                                                               | 0.0                                                                               | 55.4                                                                              |                                                                                    | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 14.3                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Notes</b>                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 11: Honoapiilani Highway & Keawe Street

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 60                                                                                | 185                                                                               | 60                                                                                | 125                                                                               | 110                                                                               | 695                                                                               | 55                                                                                  | 1090                                                                                | 195                                                                                 | 630                                                                                 | 1415                                                                                | 65                                                                                  |
| Future Volume (veh/h)        | 60                                                                                | 185                                                                               | 60                                                                                | 125                                                                               | 110                                                                               | 695                                                                               | 55                                                                                  | 1090                                                                                | 195                                                                                 | 630                                                                                 | 1415                                                                                | 65                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                                |                                                                                     | 0.99                                                                                | 1.00                                                                                |                                                                                     | 0.99                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 65                                                                                | 201                                                                               | 7                                                                                 | 136                                                                               | 120                                                                               | 458                                                                               | 60                                                                                  | 1185                                                                                | 132                                                                                 | 685                                                                                 | 1538                                                                                | 69                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   | 2                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 93                                                                                | 223                                                                               | 297                                                                               | 215                                                                               | 566                                                                               | 472                                                                               | 77                                                                                  | 1402                                                                                | 622                                                                                 | 728                                                                                 | 1945                                                                                | 87                                                                                  |
| Arrive On Green              | 0.19                                                                              | 0.19                                                                              | 0.19                                                                              | 0.08                                                                              | 0.30                                                                              | 0.30                                                                              | 0.04                                                                                | 0.40                                                                                | 0.40                                                                                | 0.42                                                                                | 1.00                                                                                | 1.00                                                                                |
| Sat Flow, veh/h              | 311                                                                               | 1157                                                                              | 1539                                                                              | 1774                                                                              | 1863                                                                              | 1555                                                                              | 1774                                                                                | 3539                                                                                | 1571                                                                                | 3442                                                                                | 3450                                                                                | 154                                                                                 |
| Grp Volume(v), veh/h         | 266                                                                               | 0                                                                                 | 7                                                                                 | 136                                                                               | 120                                                                               | 458                                                                               | 60                                                                                  | 1185                                                                                | 132                                                                                 | 685                                                                                 | 786                                                                                 | 821                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1468                                                                              | 0                                                                                 | 1539                                                                              | 1774                                                                              | 1863                                                                              | 1555                                                                              | 1774                                                                                | 1770                                                                                | 1571                                                                                | 1721                                                                                | 1770                                                                                | 1835                                                                                |
| Q Serve(g_s), s              | 21.3                                                                              | 0.0                                                                               | 0.5                                                                               | 8.0                                                                               | 6.5                                                                               | 39.2                                                                              | 4.5                                                                                 | 41.0                                                                                | 7.5                                                                                 | 25.8                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Cycle Q Clear(g_c), s        | 24.0                                                                              | 0.0                                                                               | 0.5                                                                               | 8.0                                                                               | 6.5                                                                               | 39.2                                                                              | 4.5                                                                                 | 41.0                                                                                | 7.5                                                                                 | 25.8                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Prop In Lane                 | 0.24                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 0.08                                                                                |
| Lane Grp Cap(c), veh/h       | 316                                                                               | 0                                                                                 | 297                                                                               | 215                                                                               | 566                                                                               | 472                                                                               | 77                                                                                  | 1402                                                                                | 622                                                                                 | 728                                                                                 | 998                                                                                 | 1034                                                                                |
| V/C Ratio(X)                 | 0.84                                                                              | 0.00                                                                              | 0.02                                                                              | 0.63                                                                              | 0.21                                                                              | 0.97                                                                              | 0.78                                                                                | 0.85                                                                                | 0.21                                                                                | 0.94                                                                                | 0.79                                                                                | 0.79                                                                                |
| Avail Cap(c_a), veh/h        | 316                                                                               | 0                                                                                 | 297                                                                               | 229                                                                               | 566                                                                               | 472                                                                               | 276                                                                                 | 1402                                                                                | 622                                                                                 | 790                                                                                 | 998                                                                                 | 1034                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.88                                                                                | 0.88                                                                                | 0.88                                                                                | 0.13                                                                                | 0.13                                                                                | 0.13                                                                                |
| Uniform Delay (d), s/veh     | 53.3                                                                              | 0.0                                                                               | 44.2                                                                              | 39.8                                                                              | 35.0                                                                              | 46.4                                                                              | 63.9                                                                                | 37.0                                                                                | 26.9                                                                                | 38.2                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Incr Delay (d2), s/veh       | 18.0                                                                              | 0.0                                                                               | 0.0                                                                               | 5.1                                                                               | 0.2                                                                               | 33.6                                                                              | 5.4                                                                                 | 5.7                                                                                 | 0.7                                                                                 | 3.4                                                                                 | 0.8                                                                                 | 0.8                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 11.3                                                                              | 0.0                                                                               | 0.2                                                                               | 4.2                                                                               | 3.4                                                                               | 21.2                                                                              | 2.3                                                                                 | 21.2                                                                                | 3.3                                                                                 | 12.4                                                                                | 0.2                                                                                 | 0.2                                                                                 |
| LnGrp Delay(d),s/veh         | 71.3                                                                              | 0.0                                                                               | 44.2                                                                              | 44.9                                                                              | 35.2                                                                              | 79.9                                                                              | 69.3                                                                                | 42.7                                                                                | 27.6                                                                                | 41.6                                                                                | 0.8                                                                                 | 0.8                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 | D                                                                                 | E                                                                                 | E                                                                                   | D                                                                                   | C                                                                                   | D                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 273                                                                               |                                                                                   |                                                                                   | 714                                                                               |                                                                                   |                                                                                     | 1377                                                                                |                                                                                     |                                                                                     | 2292                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 70.6                                                                              |                                                                                   |                                                                                   | 65.7                                                                              |                                                                                   |                                                                                     | 42.4                                                                                |                                                                                     |                                                                                     | 13.0                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                     | D                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 9.9                                                                               | 80.1                                                                              | 15.0                                                                              | 30.0                                                                              | 32.5                                                                              | 57.5                                                                              |                                                                                     | 45.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 21.0                                                                              | 60.0                                                                              | 11.0                                                                              | 24.0                                                                              | 31.0                                                                              | 50.0                                                                              |                                                                                     | 40.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 6.5                                                                               | 2.0                                                                               | 10.0                                                                              | 26.0                                                                              | 27.8                                                                              | 43.0                                                                              |                                                                                     | 41.2                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.1                                                                               | 29.8                                                                              | 0.0                                                                               | 0.0                                                                               | 0.8                                                                               | 5.3                                                                               |                                                                                     | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 33.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



---

## **APPENDIX C**

### **LEVEL OF SERVICE CALCULATIONS**

- Base Year 2027 WE Peak
-

# HCM 2010 Signalized Intersection Summary

## 1: Napilihau Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 40                                                                                | 45                                                                                | 330                                                                               | 45                                                                                | 50                                                                                | 20                                                                                | 270                                                                                | 385                                                                                 | 40                                                                                  | 20                                                                                  | 365                                                                                 | 90                                                                                  |
| Future Volume (veh/h)        | 40                                                                                | 45                                                                                | 330                                                                               | 45                                                                                | 50                                                                                | 20                                                                                | 270                                                                                | 385                                                                                 | 40                                                                                  | 20                                                                                  | 365                                                                                 | 90                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                  | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.99                                                                              | 0.99                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 43                                                                                | 49                                                                                | 30                                                                                | 49                                                                                | 54                                                                                | 10                                                                                | 293                                                                                | 418                                                                                 | 25                                                                                  | 22                                                                                  | 397                                                                                 | 34                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 172                                                                               | 120                                                                               | 188                                                                               | 229                                                                               | 183                                                                               | 34                                                                                | 372                                                                                | 999                                                                                 | 847                                                                                 | 28                                                                                  | 637                                                                                 | 541                                                                                 |
| Arrive On Green              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.21                                                                               | 0.54                                                                                | 0.54                                                                                | 0.02                                                                                | 0.34                                                                                | 0.34                                                                                |
| Sat Flow, veh/h              | 534                                                                               | 996                                                                               | 1564                                                                              | 1303                                                                              | 1526                                                                              | 283                                                                               | 1774                                                                               | 1863                                                                                | 1580                                                                                | 1774                                                                                | 1863                                                                                | 1581                                                                                |
| Grp Volume(v), veh/h         | 92                                                                                | 0                                                                                 | 30                                                                                | 49                                                                                | 0                                                                                 | 64                                                                                | 293                                                                                | 418                                                                                 | 25                                                                                  | 22                                                                                  | 397                                                                                 | 34                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1530                                                                              | 0                                                                                 | 1564                                                                              | 1303                                                                              | 0                                                                                 | 1809                                                                              | 1774                                                                               | 1863                                                                                | 1580                                                                                | 1774                                                                                | 1863                                                                                | 1581                                                                                |
| Q Serve(g_s), s              | 1.2                                                                               | 0.0                                                                               | 0.8                                                                               | 1.8                                                                               | 0.0                                                                               | 1.6                                                                               | 7.6                                                                                | 6.5                                                                                 | 0.4                                                                                 | 0.6                                                                                 | 8.7                                                                                 | 0.7                                                                                 |
| Cycle Q Clear(g_c), s        | 2.8                                                                               | 0.0                                                                               | 0.8                                                                               | 4.6                                                                               | 0.0                                                                               | 1.6                                                                               | 7.6                                                                                | 6.5                                                                                 | 0.4                                                                                 | 0.6                                                                                 | 8.7                                                                                 | 0.7                                                                                 |
| Prop In Lane                 | 0.47                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.16                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 292                                                                               | 0                                                                                 | 188                                                                               | 229                                                                               | 0                                                                                 | 217                                                                               | 372                                                                                | 999                                                                                 | 847                                                                                 | 28                                                                                  | 637                                                                                 | 541                                                                                 |
| V/C Ratio(X)                 | 0.32                                                                              | 0.00                                                                              | 0.16                                                                              | 0.21                                                                              | 0.00                                                                              | 0.29                                                                              | 0.79                                                                               | 0.42                                                                                | 0.03                                                                                | 0.78                                                                                | 0.62                                                                                | 0.06                                                                                |
| Avail Cap(c_a), veh/h        | 873                                                                               | 0                                                                                 | 769                                                                               | 713                                                                               | 0                                                                                 | 890                                                                               | 1091                                                                               | 3016                                                                                | 2559                                                                                | 545                                                                                 | 2443                                                                                | 2074                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 20.1                                                                              | 0.0                                                                               | 19.3                                                                              | 22.3                                                                              | 0.0                                                                               | 19.6                                                                              | 18.2                                                                               | 6.8                                                                                 | 5.3                                                                                 | 23.9                                                                                | 13.4                                                                                | 10.8                                                                                |
| Incr Delay (d2), s/veh       | 0.6                                                                               | 0.0                                                                               | 0.4                                                                               | 0.5                                                                               | 0.0                                                                               | 0.7                                                                               | 3.7                                                                                | 0.6                                                                                 | 0.0                                                                                 | 36.3                                                                                | 2.1                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.2                                                                               | 0.0                                                                               | 0.4                                                                               | 0.7                                                                               | 0.0                                                                               | 0.8                                                                               | 4.1                                                                                | 3.4                                                                                 | 0.2                                                                                 | 0.6                                                                                 | 4.8                                                                                 | 0.3                                                                                 |
| LnGrp Delay(d),s/veh         | 20.7                                                                              | 0.0                                                                               | 19.7                                                                              | 22.7                                                                              | 0.0                                                                               | 20.3                                                                              | 22.0                                                                               | 7.4                                                                                 | 5.4                                                                                 | 60.2                                                                                | 15.5                                                                                | 10.9                                                                                |
| LnGrp LOS                    | C                                                                                 |                                                                                   | B                                                                                 | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                  | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 122                                                                               |                                                                                   |                                                                                   | 113                                                                               |                                                                                   |                                                                                    | 736                                                                                 |                                                                                     |                                                                                     | 453                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 20.4                                                                              |                                                                                   |                                                                                   | 21.4                                                                              |                                                                                   |                                                                                    | 13.1                                                                                |                                                                                     |                                                                                     | 17.4                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.8                                                                               | 32.2                                                                              |                                                                                   | 10.9                                                                              | 15.2                                                                              | 22.7                                                                              |                                                                                    | 10.9                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 79.0                                                                              |                                                                                   | 24.0                                                                              | 30.0                                                                              | 64.0                                                                              |                                                                                    | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.6                                                                               | 8.5                                                                               |                                                                                   | 4.8                                                                               | 9.6                                                                               | 10.7                                                                              |                                                                                    | 6.6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 6.2                                                                               |                                                                                   | 0.5                                                                               | 0.8                                                                               | 5.8                                                                               |                                                                                    | 0.4                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 15.7                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 2: Hoohui Road

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 55                                                                                | 20                                                                                | 195                                                                               | 40                                                                                | 15                                                                                | 5                                                                                 | 135                                                                                 | 525                                                                                 | 25                                                                                  | 15                                                                                  | 575                                                                                 | 60                                                                                  |
| Future Volume (veh/h)        | 55                                                                                | 20                                                                                | 195                                                                               | 40                                                                                | 15                                                                                | 5                                                                                 | 135                                                                                 | 525                                                                                 | 25                                                                                  | 15                                                                                  | 575                                                                                 | 60                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                              |                                                                                   | 0.98                                                                              | 0.99                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 60                                                                                | 22                                                                                | 17                                                                                | 43                                                                                | 16                                                                                | 1                                                                                 | 147                                                                                 | 571                                                                                 | 0                                                                                   | 16                                                                                  | 625                                                                                 | 28                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 269                                                                               | 78                                                                                | 218                                                                               | 282                                                                               | 243                                                                               | 15                                                                                | 412                                                                                 | 935                                                                                 | 795                                                                                 | 413                                                                                 | 811                                                                                 | 687                                                                                 |
| Arrive On Green              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.08                                                                                | 0.50                                                                                | 0.00                                                                                | 0.01                                                                                | 0.44                                                                                | 0.44                                                                                |
| Sat Flow, veh/h              | 957                                                                               | 559                                                                               | 1555                                                                              | 1344                                                                              | 1733                                                                              | 108                                                                               | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1578                                                                                |
| Grp Volume(v), veh/h         | 82                                                                                | 0                                                                                 | 17                                                                                | 43                                                                                | 0                                                                                 | 17                                                                                | 147                                                                                 | 571                                                                                 | 0                                                                                   | 16                                                                                  | 625                                                                                 | 28                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1516                                                                              | 0                                                                                 | 1555                                                                              | 1344                                                                              | 0                                                                                 | 1841                                                                              | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1578                                                                                |
| Q Serve(g_s), s              | 1.4                                                                               | 0.0                                                                               | 0.4                                                                               | 1.4                                                                               | 0.0                                                                               | 0.4                                                                               | 2.0                                                                                 | 10.2                                                                                | 0.0                                                                                 | 0.2                                                                                 | 13.2                                                                                | 0.5                                                                                 |
| Cycle Q Clear(g_c), s        | 2.1                                                                               | 0.0                                                                               | 0.4                                                                               | 3.5                                                                               | 0.0                                                                               | 0.4                                                                               | 2.0                                                                                 | 10.2                                                                                | 0.0                                                                                 | 0.2                                                                                 | 13.2                                                                                | 0.5                                                                                 |
| Prop In Lane                 | 0.73                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 347                                                                               | 0                                                                                 | 218                                                                               | 282                                                                               | 0                                                                                 | 258                                                                               | 412                                                                                 | 935                                                                                 | 795                                                                                 | 413                                                                                 | 811                                                                                 | 687                                                                                 |
| V/C Ratio(X)                 | 0.24                                                                              | 0.00                                                                              | 0.08                                                                              | 0.15                                                                              | 0.00                                                                              | 0.07                                                                              | 0.36                                                                                | 0.61                                                                                | 0.00                                                                                | 0.04                                                                                | 0.77                                                                                | 0.04                                                                                |
| Avail Cap(c_a), veh/h        | 937                                                                               | 0                                                                                 | 841                                                                               | 820                                                                               | 0                                                                                 | 996                                                                               | 848                                                                                 | 2055                                                                                | 1747                                                                                | 967                                                                                 | 2055                                                                                | 1741                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 0.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 18.0                                                                              | 0.0                                                                               | 17.3                                                                              | 19.6                                                                              | 0.0                                                                               | 17.3                                                                              | 8.3                                                                                 | 8.3                                                                                 | 0.0                                                                                 | 7.7                                                                                 | 11.1                                                                                | 7.5                                                                                 |
| Incr Delay (d2), s/veh       | 0.3                                                                               | 0.0                                                                               | 0.2                                                                               | 0.2                                                                               | 0.0                                                                               | 0.1                                                                               | 0.5                                                                                 | 0.7                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 1.6                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.0                                                                               | 0.0                                                                               | 0.2                                                                               | 0.5                                                                               | 0.0                                                                               | 0.2                                                                               | 1.0                                                                                 | 5.2                                                                                 | 0.0                                                                                 | 0.1                                                                                 | 7.0                                                                                 | 0.2                                                                                 |
| LnGrp Delay(d),s/veh         | 18.3                                                                              | 0.0                                                                               | 17.4                                                                              | 19.9                                                                              | 0.0                                                                               | 17.4                                                                              | 8.8                                                                                 | 8.9                                                                                 | 0.0                                                                                 | 7.7                                                                                 | 12.7                                                                                | 7.5                                                                                 |
| LnGrp LOS                    | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                 |                                                                                   | B                                                                                 | A                                                                                   | A                                                                                   |                                                                                     | A                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 99                                                                                |                                                                                   | 60                                                                                |                                                                                   |                                                                                   |                                                                                   | 718                                                                                 |                                                                                     |                                                                                     |                                                                                     | 669                                                                                 |                                                                                     |
| Approach Delay, s/veh        | 18.2                                                                              |                                                                                   | 19.2                                                                              |                                                                                   |                                                                                   |                                                                                   | 8.9                                                                                 |                                                                                     |                                                                                     |                                                                                     | 12.4                                                                                |                                                                                     |
| Approach LOS                 | B                                                                                 |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   | A                                                                                   |                                                                                     |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 4                                                                                 |                                                                                   | 5                                                                                 | 6                                                                                 | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.6                                                                               | 29.2                                                                              | 11.5                                                                              |                                                                                   | 8.6                                                                               | 26.1                                                                              | 11.5                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 6.0                                                                               | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 51.0                                                                              | 25.0                                                                              |                                                                                   | 15.0                                                                              | 51.0                                                                              | 25.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.2                                                                               | 12.2                                                                              | 4.1                                                                               |                                                                                   | 4.0                                                                               | 15.2                                                                              | 5.5                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 4.1                                                                               | 0.4                                                                               |                                                                                   | 0.3                                                                               | 4.7                                                                               | 0.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 11.4                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 3: Honoapiilani Highway & Akahele Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 40                                                                                | 5                                                                                 | 85                                                                                | 10                                                                                | 5                                                                                 | 10                                                                                | 80                                                                                 | 630                                                                                 | 15                                                                                  | 5                                                                                   | 770                                                                                 | 50                                                                                  |
| Future Volume (veh/h)        | 40                                                                                | 5                                                                                 | 85                                                                                | 10                                                                                | 5                                                                                 | 10                                                                                | 80                                                                                 | 630                                                                                 | 15                                                                                  | 5                                                                                   | 770                                                                                 | 50                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                  | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 43                                                                                | 5                                                                                 | 4                                                                                 | 11                                                                                | 5                                                                                 | 1                                                                                 | 87                                                                                 | 685                                                                                 | 11                                                                                  | 5                                                                                   | 837                                                                                 | 31                                                                                  |
| Adj No. of Lanes             | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 58                                                                                | 99                                                                                | 79                                                                                | 20                                                                                | 152                                                                               | 129                                                                               | 115                                                                                | 1093                                                                                | 929                                                                                 | 7                                                                                   | 979                                                                                 | 832                                                                                 |
| Arrive On Green              | 0.03                                                                              | 0.10                                                                              | 0.10                                                                              | 0.01                                                                              | 0.08                                                                              | 0.08                                                                              | 0.06                                                                               | 0.59                                                                                | 0.59                                                                                | 0.00                                                                                | 0.53                                                                                | 0.53                                                                                |
| Sat Flow, veh/h              | 1774                                                                              | 955                                                                               | 764                                                                               | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1582                                                                                |
| Grp Volume(v), veh/h         | 43                                                                                | 0                                                                                 | 9                                                                                 | 11                                                                                | 5                                                                                 | 1                                                                                 | 87                                                                                 | 685                                                                                 | 11                                                                                  | 5                                                                                   | 837                                                                                 | 31                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1774                                                                              | 0                                                                                 | 1719                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1582                                                                                |
| Q Serve(g_s), s              | 1.6                                                                               | 0.0                                                                               | 0.3                                                                               | 0.4                                                                               | 0.2                                                                               | 0.0                                                                               | 3.3                                                                                | 16.3                                                                                | 0.2                                                                                 | 0.2                                                                                 | 26.2                                                                                | 0.6                                                                                 |
| Cycle Q Clear(g_c), s        | 1.6                                                                               | 0.0                                                                               | 0.3                                                                               | 0.4                                                                               | 0.2                                                                               | 0.0                                                                               | 3.3                                                                                | 16.3                                                                                | 0.2                                                                                 | 0.2                                                                                 | 26.2                                                                                | 0.6                                                                                 |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 0.44                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 58                                                                                | 0                                                                                 | 177                                                                               | 20                                                                                | 152                                                                               | 129                                                                               | 115                                                                                | 1093                                                                                | 929                                                                                 | 7                                                                                   | 979                                                                                 | 832                                                                                 |
| V/C Ratio(X)                 | 0.74                                                                              | 0.00                                                                              | 0.05                                                                              | 0.56                                                                              | 0.03                                                                              | 0.01                                                                              | 0.76                                                                               | 0.63                                                                                | 0.01                                                                                | 0.71                                                                                | 0.85                                                                                | 0.04                                                                                |
| Avail Cap(c_a), veh/h        | 524                                                                               | 0                                                                                 | 533                                                                               | 524                                                                               | 577                                                                               | 491                                                                               | 655                                                                                | 1787                                                                                | 1519                                                                                | 655                                                                                 | 1787                                                                                | 1518                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 32.5                                                                              | 0.0                                                                               | 27.4                                                                              | 33.3                                                                              | 28.7                                                                              | 28.6                                                                              | 31.2                                                                               | 9.2                                                                                 | 5.8                                                                                 | 33.7                                                                                | 13.8                                                                                | 7.8                                                                                 |
| Incr Delay (d2), s/veh       | 16.7                                                                              | 0.0                                                                               | 0.1                                                                               | 22.8                                                                              | 0.1                                                                               | 0.0                                                                               | 9.7                                                                                | 0.6                                                                                 | 0.0                                                                                 | 82.4                                                                                | 2.3                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.1                                                                               | 0.0                                                                               | 0.2                                                                               | 0.3                                                                               | 0.1                                                                               | 0.0                                                                               | 1.9                                                                                | 8.4                                                                                 | 0.1                                                                                 | 0.3                                                                                 | 13.9                                                                                | 0.3                                                                                 |
| LnGrp Delay(d),s/veh         | 49.1                                                                              | 0.0                                                                               | 27.5                                                                              | 56.1                                                                              | 28.7                                                                              | 28.6                                                                              | 40.9                                                                               | 9.8                                                                                 | 5.8                                                                                 | 116.1                                                                               | 16.1                                                                                | 7.8                                                                                 |
| LnGrp LOS                    | D                                                                                 |                                                                                   | C                                                                                 | E                                                                                 | C                                                                                 | C                                                                                 | D                                                                                  | A                                                                                   | A                                                                                   | F                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 52                                                                                |                                                                                   |                                                                                   | 17                                                                                |                                                                                   |                                                                                   | 783                                                                                |                                                                                     |                                                                                     | 873                                                                                 |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 45.4                                                                              |                                                                                   |                                                                                   | 46.5                                                                              |                                                                                   |                                                                                   | 13.2                                                                               |                                                                                     |                                                                                     | 16.4                                                                                |                                                                                     |                                                                                     |
| Approach LOS                 | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | B                                                                                  |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.3                                                                               | 44.7                                                                              | 5.7                                                                               | 12.0                                                                              | 9.4                                                                               | 40.6                                                                              | 7.2                                                                                | 10.5                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              | 25.0                                                                              | 65.0                                                                              | 20.0                                                                               | 21.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.2                                                                               | 18.3                                                                              | 2.4                                                                               | 2.3                                                                               | 5.3                                                                               | 28.2                                                                              | 3.6                                                                                | 2.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 5.4                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                               | 7.4                                                                               | 0.1                                                                                | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          | 16.1                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 4: Honoapiilani Highway & Lower Honoapiilani Road

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 50                                                                                | 10                                                                                | 595                                                                               | 10                                                                                | 0                                                                                 | 5                                                                                 | 410                                                                                | 660                                                                                 | 5                                                                                   | 0                                                                                   | 830                                                                                 | 50                                                                                  |
| Future Volume (veh/h)        | 50                                                                                | 10                                                                                | 595                                                                               | 10                                                                                | 0                                                                                 | 5                                                                                 | 410                                                                                | 660                                                                                 | 5                                                                                   | 0                                                                                   | 830                                                                                 | 50                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 54                                                                                | 11                                                                                | 0                                                                                 | 11                                                                                | 0                                                                                 | 1                                                                                 | 446                                                                                | 717                                                                                 | 5                                                                                   | 0                                                                                   | 902                                                                                 | 18                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 175                                                                               | 15                                                                                | 92                                                                                | 190                                                                               | 4                                                                                 | 8                                                                                 | 509                                                                                | 2775                                                                                | 19                                                                                  | 3                                                                                   | 1490                                                                                | 664                                                                                 |
| Arrive On Green              | 0.07                                                                              | 0.06                                                                              | 0.00                                                                              | 0.07                                                                              | 0.00                                                                              | 0.06                                                                              | 0.29                                                                               | 0.77                                                                                | 0.77                                                                                | 0.00                                                                                | 0.42                                                                                | 0.42                                                                                |
| Sat Flow, veh/h              | 1240                                                                              | 253                                                                               | 1583                                                                              | 1422                                                                              | 64                                                                                | 135                                                                               | 1774                                                                               | 3603                                                                                | 25                                                                                  | 1774                                                                                | 3539                                                                                | 1578                                                                                |
| Grp Volume(v), veh/h         | 65                                                                                | 0                                                                                 | 0                                                                                 | 12                                                                                | 0                                                                                 | 0                                                                                 | 446                                                                                | 352                                                                                 | 370                                                                                 | 0                                                                                   | 902                                                                                 | 18                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1493                                                                              | 0                                                                                 | 1583                                                                              | 1622                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                               | 1770                                                                                | 1858                                                                                | 1774                                                                                | 1770                                                                                | 1578                                                                                |
| Q Serve(g_s), s              | 2.3                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 15.4                                                                               | 3.7                                                                                 | 3.7                                                                                 | 0.0                                                                                 | 12.7                                                                                | 0.4                                                                                 |
| Cycle Q Clear(g_c), s        | 2.7                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 15.4                                                                               | 3.7                                                                                 | 3.7                                                                                 | 0.0                                                                                 | 12.7                                                                                | 0.4                                                                                 |
| Prop In Lane                 | 0.83                                                                              |                                                                                   | 1.00                                                                              | 0.92                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                               |                                                                                     | 0.01                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 213                                                                               | 0                                                                                 | 92                                                                                | 227                                                                               | 0                                                                                 | 0                                                                                 | 509                                                                                | 1363                                                                                | 1431                                                                                | 3                                                                                   | 1490                                                                                | 664                                                                                 |
| V/C Ratio(X)                 | 0.31                                                                              | 0.00                                                                              | 0.00                                                                              | 0.05                                                                              | 0.00                                                                              | 0.00                                                                              | 0.88                                                                               | 0.26                                                                                | 0.26                                                                                | 0.00                                                                                | 0.61                                                                                | 0.03                                                                                |
| Avail Cap(c_a), veh/h        | 585                                                                               | 0                                                                                 | 494                                                                               | 696                                                                               | 0                                                                                 | 0                                                                                 | 1965                                                                               | 1905                                                                                | 2000                                                                                | 1965                                                                                | 3810                                                                                | 1698                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 0.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 29.2                                                                              | 0.0                                                                               | 0.0                                                                               | 28.2                                                                              | 0.0                                                                               | 0.0                                                                               | 21.8                                                                               | 2.1                                                                                 | 2.1                                                                                 | 0.0                                                                                 | 14.4                                                                                | 10.9                                                                                |
| Incr Delay (d2), s/veh       | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 1.9                                                                                | 0.2                                                                                 | 0.2                                                                                 | 0.0                                                                                 | 0.9                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.1                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 7.7                                                                                | 1.8                                                                                 | 1.9                                                                                 | 0.0                                                                                 | 6.3                                                                                 | 0.2                                                                                 |
| LnGrp Delay(d),s/veh         | 30.0                                                                              | 0.0                                                                               | 0.0                                                                               | 28.3                                                                              | 0.0                                                                               | 0.0                                                                               | 23.7                                                                               | 2.3                                                                                 | 2.3                                                                                 | 0.0                                                                                 | 15.3                                                                                | 10.9                                                                                |
| LnGrp LOS                    | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                  | A                                                                                   | A                                                                                   |                                                                                     | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 65                                                                                |                                                                                   |                                                                                   | 12                                                                                |                                                                                   |                                                                                    | 1168                                                                                |                                                                                     |                                                                                     | 920                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 30.0                                                                              |                                                                                   |                                                                                   | 28.3                                                                              |                                                                                   |                                                                                    | 10.5                                                                                |                                                                                     |                                                                                     | 15.2                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 22.4                                                                              | 33.0                                                                              |                                                                                   | 8.7                                                                               | 0.0                                                                               | 55.4                                                                              |                                                                                    | 8.7                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 71.0                                                                              | 69.0                                                                              |                                                                                   | 25.0                                                                              | 71.0                                                                              | 69.0                                                                              |                                                                                    | 20.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 17.4                                                                              | 14.7                                                                              |                                                                                   | 2.4                                                                               | 0.0                                                                               | 5.7                                                                               |                                                                                    | 4.7                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 1.0                                                                               | 12.3                                                                              |                                                                                   | 0.0                                                                               | 0.0                                                                               | 8.0                                                                               |                                                                                    | 0.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 13.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 5: Honoapiilani Highway & Halawai Drive

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 55                                                                                | 5                                                                                 | 145                                                                               | 15                                                                                | 5                                                                                 | 15                                                                                | 105                                                                                 | 1020                                                                                | 20                                                                                  | 10                                                                                  | 1400                                                                                | 65                                                                                  |
| Future Volume (veh/h)        | 55                                                                                | 5                                                                                 | 145                                                                               | 15                                                                                | 5                                                                                 | 15                                                                                | 105                                                                                 | 1020                                                                                | 20                                                                                  | 10                                                                                  | 1400                                                                                | 65                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                              |                                                                                   | 0.98                                                                              | 0.98                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 60                                                                                | 5                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                 | 1                                                                                 | 114                                                                                 | 1109                                                                                | 21                                                                                  | 11                                                                                  | 1522                                                                                | 41                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 211                                                                               | 14                                                                                | 136                                                                               | 142                                                                               | 34                                                                                | 5                                                                                 | 146                                                                                 | 2569                                                                                | 49                                                                                  | 14                                                                                  | 2298                                                                                | 1026                                                                                |
| Arrive On Green              | 0.10                                                                              | 0.09                                                                              | 0.09                                                                              | 0.10                                                                              | 0.09                                                                              | 0.09                                                                              | 0.08                                                                                | 0.72                                                                                | 0.72                                                                                | 0.01                                                                                | 0.65                                                                                | 0.65                                                                                |
| Sat Flow, veh/h              | 1380                                                                              | 155                                                                               | 1546                                                                              | 704                                                                               | 387                                                                               | 52                                                                                | 1774                                                                                | 3553                                                                                | 67                                                                                  | 1774                                                                                | 3539                                                                                | 1580                                                                                |
| Grp Volume(v), veh/h         | 65                                                                                | 0                                                                                 | 6                                                                                 | 22                                                                                | 0                                                                                 | 0                                                                                 | 114                                                                                 | 552                                                                                 | 578                                                                                 | 11                                                                                  | 1522                                                                                | 41                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1535                                                                              | 0                                                                                 | 1546                                                                              | 1143                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                                | 1770                                                                                | 1851                                                                                | 1774                                                                                | 1770                                                                                | 1580                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.3                                                                               | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 4.9                                                                                 | 9.7                                                                                 | 9.7                                                                                 | 0.5                                                                                 | 20.5                                                                                | 0.7                                                                                 |
| Cycle Q Clear(g_c), s        | 2.7                                                                               | 0.0                                                                               | 0.3                                                                               | 2.8                                                                               | 0.0                                                                               | 0.0                                                                               | 4.9                                                                                 | 9.7                                                                                 | 9.7                                                                                 | 0.5                                                                                 | 20.5                                                                                | 0.7                                                                                 |
| Prop In Lane                 | 0.92                                                                              |                                                                                   | 1.00                                                                              | 0.73                                                                              |                                                                                   | 0.05                                                                              | 1.00                                                                                |                                                                                     | 0.04                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 244                                                                               | 0                                                                                 | 136                                                                               | 196                                                                               | 0                                                                                 | 0                                                                                 | 146                                                                                 | 1280                                                                                | 1338                                                                                | 14                                                                                  | 2298                                                                                | 1026                                                                                |
| V/C Ratio(X)                 | 0.27                                                                              | 0.00                                                                              | 0.04                                                                              | 0.11                                                                              | 0.00                                                                              | 0.00                                                                              | 0.78                                                                                | 0.43                                                                                | 0.43                                                                                | 0.76                                                                                | 0.66                                                                                | 0.04                                                                                |
| Avail Cap(c_a), veh/h        | 538                                                                               | 0                                                                                 | 458                                                                               | 502                                                                               | 0                                                                                 | 0                                                                                 | 480                                                                                 | 1962                                                                                | 2052                                                                                | 252                                                                                 | 3467                                                                                | 1547                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 33.0                                                                              | 0.0                                                                               | 32.4                                                                              | 32.5                                                                              | 0.0                                                                               | 0.0                                                                               | 34.9                                                                                | 4.3                                                                                 | 4.3                                                                                 | 38.4                                                                                | 8.4                                                                                 | 4.9                                                                                 |
| Incr Delay (d2), s/veh       | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 3.5                                                                                 | 0.5                                                                                 | 0.5                                                                                 | 25.5                                                                                | 0.7                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.3                                                                               | 0.0                                                                               | 0.1                                                                               | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 2.5                                                                                 | 4.8                                                                                 | 5.0                                                                                 | 0.3                                                                                 | 10.2                                                                                | 0.3                                                                                 |
| LnGrp Delay(d),s/veh         | 33.2                                                                              | 0.0                                                                               | 32.4                                                                              | 32.6                                                                              | 0.0                                                                               | 0.0                                                                               | 38.4                                                                                | 4.8                                                                                 | 4.8                                                                                 | 63.9                                                                                | 9.1                                                                                 | 4.9                                                                                 |
| LnGrp LOS                    | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                 |                                                                                   |                                                                                   | D                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 71                                                                                |                                                                                   |                                                                                   | 22                                                                                |                                                                                   |                                                                                     | 1244                                                                                |                                                                                     |                                                                                     | 1574                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 33.2                                                                              |                                                                                   |                                                                                   | 32.6                                                                              |                                                                                   |                                                                                     | 7.9                                                                                 |                                                                                     |                                                                                     | 9.4                                                                                 |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 10.4                                                                              | 55.4                                                                              |                                                                                   | 11.8                                                                              | 4.6                                                                               | 61.1                                                                              |                                                                                     | 11.8                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 21.0                                                                              | 76.0                                                                              |                                                                                   | 23.0                                                                              | 11.0                                                                              | 86.0                                                                              |                                                                                     | 23.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 6.9                                                                               | 22.5                                                                              |                                                                                   | 4.8                                                                               | 2.5                                                                               | 11.7                                                                              |                                                                                     | 4.7                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.1                                                                               | 27.8                                                                              |                                                                                   | 0.0                                                                               | 0.0                                                                               | 16.3                                                                              |                                                                                     | 0.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 9.5                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

HCM 2010 Signalized Intersection Summary  
6: Honoapiilani Highway & Kai Ala Drive/Puukolii Road

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 60                                                                                | 5                                                                                 | 180                                                                               | 45                                                                                | 5                                                                                 | 35                                                                                | 110                                                                                 | 1115                                                                                | 50                                                                                  | 30                                                                                  | 1480                                                                                | 75                                                                                  |
| Future Volume (veh/h)        | 60                                                                                | 5                                                                                 | 180                                                                               | 45                                                                                | 5                                                                                 | 35                                                                                | 110                                                                                 | 1115                                                                                | 50                                                                                  | 30                                                                                  | 1480                                                                                | 75                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 65                                                                                | 5                                                                                 | 11                                                                                | 49                                                                                | 5                                                                                 | 2                                                                                 | 120                                                                                 | 1212                                                                                | 34                                                                                  | 33                                                                                  | 1609                                                                                | 47                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 263                                                                               | 17                                                                                | 223                                                                               | 217                                                                               | 179                                                                               | 71                                                                                | 153                                                                                 | 2309                                                                                | 1033                                                                                | 56                                                                                  | 2116                                                                                | 946                                                                                 |
| Arrive On Green              | 0.15                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.09                                                                                | 0.65                                                                                | 0.65                                                                                | 0.03                                                                                | 0.60                                                                                | 0.60                                                                                |
| Sat Flow, veh/h              | 1292                                                                              | 121                                                                               | 1577                                                                              | 1387                                                                              | 1265                                                                              | 506                                                                               | 1774                                                                                | 3539                                                                                | 1583                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 70                                                                                | 0                                                                                 | 11                                                                                | 49                                                                                | 0                                                                                 | 7                                                                                 | 120                                                                                 | 1212                                                                                | 34                                                                                  | 33                                                                                  | 1609                                                                                | 47                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1413                                                                              | 0                                                                                 | 1577                                                                              | 1387                                                                              | 0                                                                                 | 1771                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 3.6                                                                               | 0.0                                                                               | 0.5                                                                               | 2.8                                                                               | 0.0                                                                               | 0.3                                                                               | 5.7                                                                                 | 15.6                                                                                | 0.7                                                                                 | 1.6                                                                                 | 28.8                                                                                | 1.1                                                                                 |
| Cycle Q Clear(g_c), s        | 3.9                                                                               | 0.0                                                                               | 0.5                                                                               | 6.7                                                                               | 0.0                                                                               | 0.3                                                                               | 5.7                                                                                 | 15.6                                                                                | 0.7                                                                                 | 1.6                                                                                 | 28.8                                                                                | 1.1                                                                                 |
| Prop In Lane                 | 0.93                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.29                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 297                                                                               | 0                                                                                 | 223                                                                               | 217                                                                               | 0                                                                                 | 250                                                                               | 153                                                                                 | 2309                                                                                | 1033                                                                                | 56                                                                                  | 2116                                                                                | 946                                                                                 |
| V/C Ratio(X)                 | 0.24                                                                              | 0.00                                                                              | 0.05                                                                              | 0.23                                                                              | 0.00                                                                              | 0.03                                                                              | 0.78                                                                                | 0.52                                                                                | 0.03                                                                                | 0.59                                                                                | 0.76                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h        | 494                                                                               | 0                                                                                 | 441                                                                               | 409                                                                               | 0                                                                                 | 495                                                                               | 434                                                                                 | 2844                                                                                | 1272                                                                                | 248                                                                                 | 2473                                                                                | 1106                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 32.9                                                                              | 0.0                                                                               | 31.9                                                                              | 36.4                                                                              | 0.0                                                                               | 31.8                                                                              | 38.5                                                                                | 7.9                                                                                 | 5.3                                                                                 | 41.0                                                                                | 12.7                                                                                | 7.2                                                                                 |
| Incr Delay (d2), s/veh       | 0.4                                                                               | 0.0                                                                               | 0.1                                                                               | 0.5                                                                               | 0.0                                                                               | 0.0                                                                               | 3.3                                                                                 | 0.4                                                                                 | 0.0                                                                                 | 3.6                                                                                 | 1.7                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.5                                                                               | 0.0                                                                               | 0.2                                                                               | 1.1                                                                               | 0.0                                                                               | 0.1                                                                               | 2.9                                                                                 | 7.5                                                                                 | 0.3                                                                                 | 0.8                                                                                 | 14.3                                                                                | 0.5                                                                                 |
| LnGrp Delay(d),s/veh         | 33.3                                                                              | 0.0                                                                               | 32.0                                                                              | 36.9                                                                              | 0.0                                                                               | 31.8                                                                              | 41.8                                                                                | 8.3                                                                                 | 5.3                                                                                 | 44.6                                                                                | 14.4                                                                                | 7.2                                                                                 |
| LnGrp LOS                    | C                                                                                 |                                                                                   | C                                                                                 | D                                                                                 |                                                                                   | C                                                                                 | D                                                                                   | A                                                                                   | A                                                                                   | D                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 81                                                                                |                                                                                   |                                                                                   | 56                                                                                |                                                                                   |                                                                                     | 1366                                                                                |                                                                                     |                                                                                     | 1689                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 33.2                                                                              |                                                                                   |                                                                                   | 36.2                                                                              |                                                                                   |                                                                                     | 11.2                                                                                |                                                                                     |                                                                                     | 14.8                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 11.4                                                                              | 57.3                                                                              |                                                                                   | 17.1                                                                              | 6.7                                                                               | 62.0                                                                              |                                                                                     | 17.1                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 21.0                                                                              | 60.0                                                                              |                                                                                   | 24.0                                                                              | 12.0                                                                              | 69.0                                                                              |                                                                                     | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 7.7                                                                               | 30.8                                                                              |                                                                                   | 8.7                                                                               | 3.6                                                                               | 17.6                                                                              |                                                                                     | 5.9                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.2                                                                               | 20.5                                                                              |                                                                                   | 0.1                                                                               | 0.0                                                                               | 19.2                                                                              |                                                                                     | 0.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 14.1                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 7: Honoapiilani Highway & Kaanapali Parkway/Halelo Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |  |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)       | 300                                                                               | 5                                                                                 | 590                                                                               | 15                                                                                | 5                                                                                 | 20                                                                                | 440                                                                                | 1175                                                                                | 15                                                                                  | 55                                                                                  | 1425                                                                                | 220                                                                                 |
| Future Volume (veh/h)        | 300                                                                               | 5                                                                                 | 590                                                                               | 15                                                                                | 5                                                                                 | 20                                                                                | 440                                                                                | 1175                                                                                | 15                                                                                  | 55                                                                                  | 1425                                                                                | 220                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 330                                                                               | 0                                                                                 | 436                                                                               | 16                                                                                | 5                                                                                 | 7                                                                                 | 478                                                                                | 1277                                                                                | 16                                                                                  | 60                                                                                  | 1549                                                                                | 196                                                                                 |
| Adj No. of Lanes             | 2                                                                                 | 0                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 2                                                                                  | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 544                                                                               | 0                                                                                 | 995                                                                               | 40                                                                                | 13                                                                                | 18                                                                                | 576                                                                                | 2325                                                                                | 29                                                                                  | 103                                                                                 | 1912                                                                                | 1088                                                                                |
| Arrive On Green              | 0.15                                                                              | 0.00                                                                              | 0.15                                                                              | 0.04                                                                              | 0.04                                                                              | 0.02                                                                              | 0.17                                                                               | 0.65                                                                                | 0.64                                                                                | 0.06                                                                                | 0.54                                                                                | 0.54                                                                                |
| Sat Flow, veh/h              | 3548                                                                              | 0                                                                                 | 3167                                                                              | 992                                                                               | 310                                                                               | 434                                                                               | 3442                                                                               | 3580                                                                                | 45                                                                                  | 1774                                                                                | 3539                                                                                | 1582                                                                                |
| Grp Volume(v), veh/h         | 330                                                                               | 0                                                                                 | 436                                                                               | 28                                                                                | 0                                                                                 | 0                                                                                 | 478                                                                                | 631                                                                                 | 662                                                                                 | 60                                                                                  | 1549                                                                                | 196                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1774                                                                              | 0                                                                                 | 1583                                                                              | 1737                                                                              | 0                                                                                 | 0                                                                                 | 1721                                                                               | 1770                                                                                | 1855                                                                                | 1774                                                                                | 1770                                                                                | 1582                                                                                |
| Q Serve(g_s), s              | 14.1                                                                              | 0.0                                                                               | 17.7                                                                              | 2.6                                                                               | 0.0                                                                               | 0.0                                                                               | 21.8                                                                               | 31.5                                                                                | 31.5                                                                                | 5.3                                                                                 | 58.0                                                                                | 7.2                                                                                 |
| Cycle Q Clear(g_c), s        | 14.1                                                                              | 0.0                                                                               | 17.7                                                                              | 2.6                                                                               | 0.0                                                                               | 0.0                                                                               | 21.8                                                                               | 31.5                                                                                | 31.5                                                                                | 5.3                                                                                 | 58.0                                                                                | 7.2                                                                                 |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.57                                                                              |                                                                                   | 0.25                                                                              | 1.00                                                                               |                                                                                     | 0.02                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 544                                                                               | 0                                                                                 | 995                                                                               | 71                                                                                | 0                                                                                 | 0                                                                                 | 576                                                                                | 1149                                                                                | 1205                                                                                | 103                                                                                 | 1912                                                                                | 1088                                                                                |
| V/C Ratio(X)                 | 0.61                                                                              | 0.00                                                                              | 0.44                                                                              | 0.40                                                                              | 0.00                                                                              | 0.00                                                                              | 0.83                                                                               | 0.55                                                                                | 0.55                                                                                | 0.58                                                                                | 0.81                                                                                | 0.18                                                                                |
| Avail Cap(c_a), veh/h        | 745                                                                               | 0                                                                                 | 1175                                                                              | 332                                                                               | 0                                                                                 | 0                                                                                 | 1232                                                                               | 2119                                                                                | 2221                                                                                | 164                                                                                 | 3298                                                                                | 1708                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 64.0                                                                              | 0.0                                                                               | 44.2                                                                              | 76.2                                                                              | 0.0                                                                               | 0.0                                                                               | 65.2                                                                               | 15.5                                                                                | 15.5                                                                                | 74.4                                                                                | 30.5                                                                                | 9.0                                                                                 |
| Incr Delay (d2), s/veh       | 0.4                                                                               | 0.0                                                                               | 0.1                                                                               | 1.3                                                                               | 0.0                                                                               | 0.0                                                                               | 1.2                                                                                | 0.6                                                                                 | 0.6                                                                                 | 2.0                                                                                 | 1.2                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 7.0                                                                               | 0.0                                                                               | 7.8                                                                               | 1.3                                                                               | 0.0                                                                               | 0.0                                                                               | 10.5                                                                               | 15.4                                                                                | 16.2                                                                                | 2.7                                                                                 | 28.5                                                                                | 4.7                                                                                 |
| LnGrp Delay(d),s/veh         | 64.5                                                                              | 0.0                                                                               | 44.3                                                                              | 77.5                                                                              | 0.0                                                                               | 0.0                                                                               | 66.5                                                                               | 16.1                                                                                | 16.0                                                                                | 76.4                                                                                | 31.7                                                                                | 9.2                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | E                                                                                 |                                                                                   |                                                                                   | E                                                                                  | B                                                                                   | B                                                                                   | E                                                                                   | C                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 766                                                                               |                                                                                   |                                                                                   | 28                                                                                |                                                                                   |                                                                                   | 1771                                                                               |                                                                                     |                                                                                     | 1805                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 53.0                                                                              |                                                                                   |                                                                                   | 77.5                                                                              |                                                                                   |                                                                                   | 29.7                                                                               |                                                                                     |                                                                                     | 30.7                                                                                |                                                                                     |                                                                                     |
| Approach LOS                 | D                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | C                                                                                  |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 31.1                                                                              | 91.5                                                                              |                                                                                   | 10.6                                                                              | 13.4                                                                              | 109.2                                                                             |                                                                                    | 28.8                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 6.0                                                                               | 6.0                                                                               |                                                                                   | 7.0                                                                               | 6.0                                                                               | 6.0                                                                               |                                                                                    | 7.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 56.0                                                                              | 149.0                                                                             |                                                                                   | 28.0                                                                              | 13.0                                                                              | 192.0                                                                             |                                                                                    | 31.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 23.8                                                                              | 60.0                                                                              |                                                                                   | 4.6                                                                               | 7.3                                                                               | 33.5                                                                              |                                                                                    | 19.7                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 1.3                                                                               | 25.5                                                                              |                                                                                   | 0.0                                                                               | 0.0                                                                               | 13.1                                                                              |                                                                                    | 2.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 34.5                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 8: Honoapiilani Highway & Leialii Parkway

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |                                                                                     |
| Traffic Volume (veh/h)       | 5                                                                                 | 0                                                                                 | 5                                                                                 | 135                                                                               | 5                                                                                 | 60                                                                                | 5                                                                                   | 1520                                                                                | 90                                                                                  | 90                                                                                  | 2020                                                                                | 10                                                                                  |
| Future Volume (veh/h)        | 5                                                                                 | 0                                                                                 | 5                                                                                 | 135                                                                               | 5                                                                                 | 60                                                                                | 5                                                                                   | 1520                                                                                | 90                                                                                  | 90                                                                                  | 2020                                                                                | 10                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 5                                                                                 | 0                                                                                 | 1                                                                                 | 147                                                                               | 5                                                                                 | 5                                                                                 | 5                                                                                   | 1652                                                                                | 95                                                                                  | 98                                                                                  | 2196                                                                                | 11                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 194                                                                               | 5                                                                                 | 30                                                                                | 234                                                                               | 107                                                                               | 107                                                                               | 11                                                                                  | 2424                                                                                | 139                                                                                 | 124                                                                                 | 2802                                                                                | 14                                                                                  |
| Arrive On Green              | 0.13                                                                              | 0.00                                                                              | 0.12                                                                              | 0.13                                                                              | 0.13                                                                              | 0.12                                                                              | 0.01                                                                                | 0.95                                                                                | 0.94                                                                                | 0.07                                                                                | 0.78                                                                                | 0.77                                                                                |
| Sat Flow, veh/h              | 1140                                                                              | 37                                                                                | 235                                                                               | 1410                                                                              | 856                                                                               | 856                                                                               | 1774                                                                                | 3403                                                                                | 195                                                                                 | 1774                                                                                | 3611                                                                                | 18                                                                                  |
| Grp Volume(v), veh/h         | 6                                                                                 | 0                                                                                 | 0                                                                                 | 147                                                                               | 0                                                                                 | 10                                                                                | 5                                                                                   | 854                                                                                 | 893                                                                                 | 98                                                                                  | 1075                                                                                | 1132                                                                                |
| Grp Sat Flow(s),veh/h/ln     | 1412                                                                              | 0                                                                                 | 0                                                                                 | 1410                                                                              | 0                                                                                 | 1712                                                                              | 1774                                                                                | 1770                                                                                | 1828                                                                                | 1774                                                                                | 1770                                                                                | 1860                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 12.4                                                                              | 0.0                                                                               | 0.7                                                                               | 0.4                                                                                 | 9.2                                                                                 | 9.7                                                                                 | 7.1                                                                                 | 45.1                                                                                | 45.3                                                                                |
| Cycle Q Clear(g_c), s        | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 13.0                                                                              | 0.0                                                                               | 0.7                                                                               | 0.4                                                                                 | 9.2                                                                                 | 9.7                                                                                 | 7.1                                                                                 | 45.1                                                                                | 45.3                                                                                |
| Prop In Lane                 | 0.83                                                                              |                                                                                   | 0.17                                                                              | 1.00                                                                              |                                                                                   | 0.50                                                                              | 1.00                                                                                |                                                                                     | 0.11                                                                                | 1.00                                                                                |                                                                                     | 0.01                                                                                |
| Lane Grp Cap(c), veh/h       | 228                                                                               | 0                                                                                 | 0                                                                                 | 234                                                                               | 0                                                                                 | 215                                                                               | 11                                                                                  | 1260                                                                                | 1302                                                                                | 124                                                                                 | 1373                                                                                | 1443                                                                                |
| V/C Ratio(X)                 | 0.03                                                                              | 0.00                                                                              | 0.00                                                                              | 0.63                                                                              | 0.00                                                                              | 0.05                                                                              | 0.44                                                                                | 0.68                                                                                | 0.69                                                                                | 0.79                                                                                | 0.78                                                                                | 0.78                                                                                |
| Avail Cap(c_a), veh/h        | 312                                                                               | 0                                                                                 | 0                                                                                 | 318                                                                               | 0                                                                                 | 316                                                                               | 150                                                                                 | 1260                                                                                | 1302                                                                                | 150                                                                                 | 1373                                                                                | 1443                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.33                                                                                | 1.33                                                                                | 1.33                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.75                                                                                | 0.75                                                                                | 0.75                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 50.0                                                                              | 0.0                                                                               | 0.0                                                                               | 55.3                                                                              | 0.0                                                                               | 50.2                                                                              | 64.2                                                                                | 1.2                                                                                 | 1.3                                                                                 | 59.5                                                                                | 8.3                                                                                 | 8.3                                                                                 |
| Incr Delay (d2), s/veh       | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 2.8                                                                               | 0.0                                                                               | 0.1                                                                               | 7.5                                                                                 | 2.2                                                                                 | 2.2                                                                                 | 16.7                                                                                | 4.5                                                                                 | 4.3                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 5.3                                                                               | 0.0                                                                               | 0.3                                                                               | 0.2                                                                                 | 4.5                                                                                 | 5.0                                                                                 | 4.1                                                                                 | 23.2                                                                                | 24.7                                                                                |
| LnGrp Delay(d),s/veh         | 50.0                                                                              | 0.0                                                                               | 0.0                                                                               | 58.1                                                                              | 0.0                                                                               | 50.3                                                                              | 71.7                                                                                | 3.5                                                                                 | 3.5                                                                                 | 76.2                                                                                | 12.8                                                                                | 12.7                                                                                |
| LnGrp LOS                    | D                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   | D                                                                                 | E                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 6                                                                                 |                                                                                   |                                                                                   | 157                                                                               |                                                                                   |                                                                                     | 1752                                                                                |                                                                                     |                                                                                     | 2305                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 50.0                                                                              |                                                                                   |                                                                                   | 57.6                                                                              |                                                                                   |                                                                                     | 3.7                                                                                 |                                                                                     |                                                                                     | 15.5                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 4.8                                                                               | 104.9                                                                             |                                                                                   | 20.3                                                                              | 13.1                                                                              | 96.6                                                                              |                                                                                     | 20.3                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 11.0                                                                              | 82.0                                                                              |                                                                                   | 23.0                                                                              | 11.0                                                                              | 82.0                                                                              |                                                                                     | 23.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.4                                                                               | 47.3                                                                              |                                                                                   | 15.0                                                                              | 9.1                                                                               | 11.7                                                                              |                                                                                     | 2.7                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 30.8                                                                              |                                                                                   | 0.3                                                                               | 0.0                                                                               | 38.3                                                                              |                                                                                     | 0.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          | 12.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 9: Honoapiilani Highway & Front Street/Flemming Road

08/09/2017

|                              |  |       |      |      |      |       |      |      |      |      |      |      |
|------------------------------|------------------------------------------------------------------------------------|-------|------|------|------|-------|------|------|------|------|------|------|
| Movement                     | EBL                                                                                | EBT   | EBR  | WBL  | WBT  | WBR   | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations          |                                                                                    | ↔     |      |      | ↔    |       | ↔    | ↔    |      | ↔    | ↔    | ↔    |
| Traffic Volume (veh/h)       | 135                                                                                | 5     | 15   | 65   | 5    | 15    | 15   | 1465 | 15   | 10   | 1795 | 260  |
| Future Volume (veh/h)        | 135                                                                                | 5     | 15   | 65   | 5    | 15    | 15   | 1465 | 15   | 10   | 1795 | 260  |
| Number                       | 3                                                                                  | 8     | 18   | 7    | 4    | 14    | 1    | 6    | 16   | 5    | 2    | 12   |
| Initial Q (Qb), veh          | 0                                                                                  | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                               |       | 1.00 | 1.00 |      | 1.00  | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Parking Bus, Adj             | 1.00                                                                               | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln       | 1900                                                                               | 1863  | 1900 | 1900 | 1863 | 1900  | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h         | 147                                                                                | 5     | 13   | 71   | 5    | 9     | 16   | 1592 | 16   | 11   | 1951 | 217  |
| Adj No. of Lanes             | 0                                                                                  | 1     | 0    | 0    | 1    | 0     | 1    | 2    | 0    | 1    | 2    | 1    |
| Peak Hour Factor             | 0.92                                                                               | 0.92  | 0.92 | 0.92 | 0.92 | 0.92  | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, %         | 2                                                                                  | 2     | 2    | 2    | 2    | 2     | 2    | 2    | 2    | 2    | 2    | 2    |
| Cap, veh/h                   | 228                                                                                | 6     | 16   | 226  | 17   | 23    | 19   | 2759 | 28   | 13   | 2709 | 1211 |
| Arrive On Green              | 0.13                                                                               | 0.13  | 0.12 | 0.13 | 0.13 | 0.12  | 0.01 | 0.77 | 0.76 | 0.01 | 0.77 | 0.77 |
| Sat Flow, veh/h              | 1339                                                                               | 46    | 118  | 1336 | 132  | 174   | 1774 | 3590 | 36   | 1774 | 3539 | 1582 |
| Grp Volume(v), veh/h         | 165                                                                                | 0     | 0    | 85   | 0    | 0     | 16   | 784  | 824  | 11   | 1951 | 217  |
| Grp Sat Flow(s),veh/h/ln     | 1503                                                                               | 0     | 0    | 1642 | 0    | 0     | 1774 | 1770 | 1856 | 1774 | 1770 | 1582 |
| Q Serve(g_s), s              | 7.8                                                                                | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 1.2  | 23.9 | 24.0 | 0.8  | 37.4 | 4.8  |
| Cycle Q Clear(g_c), s        | 13.7                                                                               | 0.0   | 0.0  | 5.9  | 0.0  | 0.0   | 1.2  | 23.9 | 24.0 | 0.8  | 37.4 | 4.8  |
| Prop In Lane                 | 0.89                                                                               |       | 0.08 | 0.84 |      | 0.11  | 1.00 |      | 0.02 | 1.00 |      | 1.00 |
| Lane Grp Cap(c), veh/h       | 250                                                                                | 0     | 0    | 267  | 0    | 0     | 19   | 1360 | 1427 | 13   | 2709 | 1211 |
| V/C Ratio(X)                 | 0.66                                                                               | 0.00  | 0.00 | 0.32 | 0.00 | 0.00  | 0.84 | 0.58 | 0.58 | 0.82 | 0.72 | 0.18 |
| Avail Cap(c_a), veh/h        | 347                                                                                | 0     | 0    | 365  | 0    | 0     | 109  | 1360 | 1427 | 109  | 2709 | 1211 |
| HCM Platoon Ratio            | 1.00                                                                               | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I)           | 1.00                                                                               | 0.00  | 0.00 | 1.00 | 0.00 | 0.00  | 0.68 | 0.68 | 0.68 | 0.50 | 0.50 | 0.50 |
| Uniform Delay (d), s/veh     | 54.8                                                                               | 0.0   | 0.0  | 51.7 | 0.0  | 0.0   | 64.2 | 6.2  | 6.3  | 64.4 | 8.0  | 4.1  |
| Incr Delay (d2), s/veh       | 3.0                                                                                | 0.0   | 0.0  | 0.7  | 0.0  | 0.0   | 21.1 | 1.2  | 1.2  | 19.7 | 0.9  | 0.2  |
| Initial Q Delay(d3),s/veh    | 0.0                                                                                | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln     | 6.0                                                                                | 0.0   | 0.0  | 2.8  | 0.0  | 0.0   | 0.7  | 12.0 | 12.6 | 0.5  | 18.2 | 2.2  |
| LnGrp Delay(d),s/veh         | 57.7                                                                               | 0.0   | 0.0  | 52.3 | 0.0  | 0.0   | 85.3 | 7.5  | 7.4  | 84.1 | 8.8  | 4.3  |
| LnGrp LOS                    | E                                                                                  |       |      | D    |      |       | F    | A    | A    | F    | A    | A    |
| Approach Vol, veh/h          | 165                                                                                |       |      | 85   |      |       | 1624 |      |      | 2179 |      |      |
| Approach Delay, s/veh        | 57.7                                                                               |       |      | 52.3 |      |       | 8.2  |      |      | 8.7  |      |      |
| Approach LOS                 | E                                                                                  |       |      | D    |      |       | A    |      |      | A    |      |      |
| Timer                        | 1                                                                                  | 2     | 3    | 4    | 5    | 6     | 7    | 8    |      |      |      |      |
| Assigned Phs                 | 1                                                                                  | 2     |      | 4    | 5    | 6     |      | 8    |      |      |      |      |
| Phs Duration (G+Y+Rc), s     | 5.4                                                                                | 103.5 |      | 21.1 | 5.0  | 103.9 |      | 21.1 |      |      |      |      |
| Change Period (Y+Rc), s      | 4.0                                                                                | 5.0   |      | 5.0  | 4.0  | 5.0   |      | 5.0  |      |      |      |      |
| Max Green Setting (Gmax), s  | 8.0                                                                                | 83.0  |      | 25.0 | 8.0  | 83.0  |      | 25.0 |      |      |      |      |
| Max Q Clear Time (g_c+I1), s | 3.2                                                                                | 39.4  |      | 7.9  | 2.8  | 26.0  |      | 15.7 |      |      |      |      |
| Green Ext Time (p_c), s      | 0.0                                                                                | 39.2  |      | 0.2  | 0.0  | 38.4  |      | 0.4  |      |      |      |      |
| <b>Intersection Summary</b>  |                                                                                    |       |      |      |      |       |      |      |      |      |      |      |
| HCM 2010 Ctrl Delay          | 11.4                                                                               |       |      |      |      |       |      |      |      |      |      |      |
| HCM 2010 LOS                 | B                                                                                  |       |      |      |      |       |      |      |      |      |      |      |



# HCM 2010 Signalized Intersection Summary

## 10: Honoapiilani Highway & Kapunakea Street

08/09/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |                                                                                     |  |  |                                                                                     |
| Traffic Volume (veh/h)       | 190                                                                               | 20                                                                                | 50                                                                                | 90                                                                                | 20                                                                                | 20                                                                                | 60                                                                                 | 1495                                                                                | 60                                                                                  | 15                                                                                  | 1810                                                                                | 130                                                                                 |
| Future Volume (veh/h)        | 190                                                                               | 20                                                                                | 50                                                                                | 90                                                                                | 20                                                                                | 20                                                                                | 60                                                                                 | 1495                                                                                | 60                                                                                  | 15                                                                                  | 1810                                                                                | 130                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 0.99                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1900                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 207                                                                               | 22                                                                                | 11                                                                                | 98                                                                                | 22                                                                                | 2                                                                                 | 65                                                                                 | 1625                                                                                | 63                                                                                  | 16                                                                                  | 1967                                                                                | 137                                                                                 |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 2                                                                                   | 0                                                                                   | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 286                                                                               | 25                                                                                | 305                                                                               | 373                                                                               | 326                                                                               | 30                                                                                | 83                                                                                 | 2443                                                                                | 94                                                                                  | 19                                                                                  | 2242                                                                                | 154                                                                                 |
| Arrive On Green              | 0.19                                                                              | 0.19                                                                              | 0.19                                                                              | 0.19                                                                              | 0.19                                                                              | 0.19                                                                              | 0.05                                                                               | 0.70                                                                                | 0.70                                                                                | 0.02                                                                                | 1.00                                                                                | 1.00                                                                                |
| Sat Flow, veh/h              | 1205                                                                              | 128                                                                               | 1576                                                                              | 1380                                                                              | 1682                                                                              | 153                                                                               | 1774                                                                               | 3474                                                                                | 134                                                                                 | 1774                                                                                | 3360                                                                                | 231                                                                                 |
| Grp Volume(v), veh/h         | 229                                                                               | 0                                                                                 | 11                                                                                | 98                                                                                | 0                                                                                 | 24                                                                                | 65                                                                                 | 825                                                                                 | 863                                                                                 | 16                                                                                  | 1025                                                                                | 1079                                                                                |
| Grp Sat Flow(s),veh/h/ln     | 1333                                                                              | 0                                                                                 | 1576                                                                              | 1380                                                                              | 0                                                                                 | 1835                                                                              | 1774                                                                               | 1770                                                                                | 1838                                                                                | 1774                                                                                | 1770                                                                                | 1822                                                                                |
| Q Serve(g_s), s              | 20.6                                                                              | 0.0                                                                               | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 1.4                                                                               | 4.7                                                                                | 33.7                                                                                | 34.2                                                                                | 1.2                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Cycle Q Clear(g_c), s        | 22.0                                                                              | 0.0                                                                               | 0.7                                                                               | 6.5                                                                               | 0.0                                                                               | 1.4                                                                               | 4.7                                                                                | 33.7                                                                                | 34.2                                                                                | 1.2                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Prop In Lane                 | 0.90                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                               |                                                                                     | 0.07                                                                                | 1.00                                                                                |                                                                                     | 0.13                                                                                |
| Lane Grp Cap(c), veh/h       | 311                                                                               | 0                                                                                 | 305                                                                               | 373                                                                               | 0                                                                                 | 355                                                                               | 83                                                                                 | 1245                                                                                | 1293                                                                                | 19                                                                                  | 1181                                                                                | 1216                                                                                |
| V/C Ratio(X)                 | 0.74                                                                              | 0.00                                                                              | 0.04                                                                              | 0.26                                                                              | 0.00                                                                              | 0.07                                                                              | 0.78                                                                               | 0.66                                                                                | 0.67                                                                                | 0.84                                                                                | 0.87                                                                                | 0.89                                                                                |
| Avail Cap(c_a), veh/h        | 331                                                                               | 0                                                                                 | 327                                                                               | 393                                                                               | 0                                                                                 | 381                                                                               | 109                                                                                | 1245                                                                                | 1293                                                                                | 109                                                                                 | 1181                                                                                | 1216                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.53                                                                               | 0.53                                                                                | 0.53                                                                                | 0.59                                                                                | 0.59                                                                                | 0.59                                                                                |
| Uniform Delay (d), s/veh     | 51.8                                                                              | 0.0                                                                               | 42.6                                                                              | 44.9                                                                              | 0.0                                                                               | 42.9                                                                              | 61.3                                                                               | 10.7                                                                                | 10.8                                                                                | 63.5                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Incr Delay (d2), s/veh       | 7.9                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.1                                                                               | 9.8                                                                                | 1.5                                                                                 | 1.5                                                                                 | 18.8                                                                                | 5.4                                                                                 | 6.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 8.7                                                                               | 0.0                                                                               | 0.3                                                                               | 3.1                                                                               | 0.0                                                                               | 0.7                                                                               | 2.5                                                                                | 16.8                                                                                | 17.6                                                                                | 0.7                                                                                 | 1.8                                                                                 | 2.1                                                                                 |
| LnGrp Delay(d),s/veh         | 59.7                                                                              | 0.0                                                                               | 42.6                                                                              | 45.3                                                                              | 0.0                                                                               | 42.9                                                                              | 71.1                                                                               | 12.2                                                                                | 12.3                                                                                | 82.3                                                                                | 5.4                                                                                 | 6.1                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 |                                                                                   | D                                                                                 | E                                                                                  | B                                                                                   | B                                                                                   | F                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 240                                                                               |                                                                                   |                                                                                   | 122                                                                               |                                                                                   |                                                                                    | 1753                                                                                |                                                                                     |                                                                                     | 2120                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 58.9                                                                              |                                                                                   |                                                                                   | 44.8                                                                              |                                                                                   |                                                                                    | 14.4                                                                                |                                                                                     |                                                                                     | 6.3                                                                                 |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 10.1                                                                              | 90.8                                                                              |                                                                                   | 29.2                                                                              | 5.4                                                                               | 95.4                                                                              |                                                                                    | 29.2                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 8.0                                                                               | 82.0                                                                              |                                                                                   | 26.0                                                                              | 8.0                                                                               | 82.0                                                                              |                                                                                    | 26.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 6.7                                                                               | 2.0                                                                               |                                                                                   | 8.5                                                                               | 3.2                                                                               | 36.2                                                                              |                                                                                    | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 58.2                                                                              |                                                                                   | 0.4                                                                               | 0.0                                                                               | 28.3                                                                              |                                                                                    | 0.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 13.8                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 11: Honoapiilani Highway & Keawe Street

08/09/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 60                                                                                | 150                                                                               | 90                                                                                | 145                                                                               | 130                                                                               | 650                                                                               | 80                                                                                  | 890                                                                                 | 195                                                                                 | 570                                                                                 | 1140                                                                                | 100                                                                                 |
| Future Volume (veh/h)        | 60                                                                                | 150                                                                               | 90                                                                                | 145                                                                               | 130                                                                               | 650                                                                               | 80                                                                                  | 890                                                                                 | 195                                                                                 | 570                                                                                 | 1140                                                                                | 100                                                                                 |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                                |                                                                                     | 0.99                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 65                                                                                | 163                                                                               | 10                                                                                | 158                                                                               | 141                                                                               | 323                                                                               | 87                                                                                  | 967                                                                                 | 127                                                                                 | 620                                                                                 | 1239                                                                                | 105                                                                                 |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   | 2                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 100                                                                               | 195                                                                               | 267                                                                               | 253                                                                               | 560                                                                               | 463                                                                               | 110                                                                                 | 1428                                                                                | 630                                                                                 | 700                                                                                 | 1801                                                                                | 152                                                                                 |
| Arrive On Green              | 0.18                                                                              | 0.18                                                                              | 0.18                                                                              | 0.09                                                                              | 0.30                                                                              | 0.30                                                                              | 0.06                                                                                | 0.40                                                                                | 0.40                                                                                | 0.14                                                                                | 0.37                                                                                | 0.36                                                                                |
| Sat Flow, veh/h              | 366                                                                               | 1107                                                                              | 1511                                                                              | 1774                                                                              | 1863                                                                              | 1541                                                                              | 1774                                                                                | 3539                                                                                | 1562                                                                                | 3442                                                                                | 3303                                                                                | 279                                                                                 |
| Grp Volume(v), veh/h         | 228                                                                               | 0                                                                                 | 10                                                                                | 158                                                                               | 141                                                                               | 323                                                                               | 87                                                                                  | 967                                                                                 | 127                                                                                 | 620                                                                                 | 663                                                                                 | 681                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1473                                                                              | 0                                                                                 | 1511                                                                              | 1774                                                                              | 1863                                                                              | 1541                                                                              | 1774                                                                                | 1770                                                                                | 1562                                                                                | 1721                                                                                | 1770                                                                                | 1813                                                                                |
| Q Serve(g_s), s              | 17.2                                                                              | 0.0                                                                               | 0.7                                                                               | 9.1                                                                               | 7.4                                                                               | 24.1                                                                              | 6.3                                                                                 | 29.1                                                                                | 6.9                                                                                 | 23.0                                                                                | 41.2                                                                                | 41.5                                                                                |
| Cycle Q Clear(g_c), s        | 19.5                                                                              | 0.0                                                                               | 0.7                                                                               | 9.1                                                                               | 7.4                                                                               | 24.1                                                                              | 6.3                                                                                 | 29.1                                                                                | 6.9                                                                                 | 23.0                                                                                | 41.2                                                                                | 41.5                                                                                |
| Prop In Lane                 | 0.29                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 0.15                                                                                |
| Lane Grp Cap(c), veh/h       | 295                                                                               | 0                                                                                 | 267                                                                               | 253                                                                               | 560                                                                               | 463                                                                               | 110                                                                                 | 1428                                                                                | 630                                                                                 | 700                                                                                 | 965                                                                                 | 988                                                                                 |
| V/C Ratio(X)                 | 0.77                                                                              | 0.00                                                                              | 0.04                                                                              | 0.62                                                                              | 0.25                                                                              | 0.70                                                                              | 0.79                                                                                | 0.68                                                                                | 0.20                                                                                | 0.89                                                                                | 0.69                                                                                | 0.69                                                                                |
| Avail Cap(c_a), veh/h        | 329                                                                               | 0                                                                                 | 302                                                                               | 278                                                                               | 630                                                                               | 521                                                                               | 328                                                                                 | 1428                                                                                | 630                                                                                 | 953                                                                                 | 965                                                                                 | 988                                                                                 |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 0.67                                                                                | 0.67                                                                                | 0.67                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.79                                                                                | 0.79                                                                                | 0.79                                                                                | 0.36                                                                                | 0.36                                                                                | 0.36                                                                                |
| Uniform Delay (d), s/veh     | 51.8                                                                              | 0.0                                                                               | 44.4                                                                              | 38.5                                                                              | 34.4                                                                              | 40.2                                                                              | 60.2                                                                                | 31.8                                                                                | 25.2                                                                                | 54.6                                                                                | 31.9                                                                                | 32.0                                                                                |
| Incr Delay (d2), s/veh       | 9.7                                                                               | 0.0                                                                               | 0.1                                                                               | 3.7                                                                               | 0.2                                                                               | 3.5                                                                               | 3.8                                                                                 | 2.1                                                                                 | 0.6                                                                                 | 2.4                                                                                 | 1.5                                                                                 | 1.4                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 8.8                                                                               | 0.0                                                                               | 0.3                                                                               | 4.7                                                                               | 3.9                                                                               | 10.7                                                                              | 3.2                                                                                 | 14.6                                                                                | 3.1                                                                                 | 11.2                                                                                | 20.6                                                                                | 21.2                                                                                |
| LnGrp Delay(d),s/veh         | 61.6                                                                              | 0.0                                                                               | 44.4                                                                              | 42.2                                                                              | 34.6                                                                              | 43.7                                                                              | 64.0                                                                                | 33.9                                                                                | 25.7                                                                                | 57.1                                                                                | 33.3                                                                                | 33.4                                                                                |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 | C                                                                                 | D                                                                                 | E                                                                                   | C                                                                                   | C                                                                                   | E                                                                                   | C                                                                                   | C                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 238                                                                               |                                                                                   |                                                                                   | 622                                                                               |                                                                                   |                                                                                     | 1181                                                                                |                                                                                     |                                                                                     | 1964                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 60.8                                                                              |                                                                                   |                                                                                   | 41.3                                                                              |                                                                                   |                                                                                     | 35.2                                                                                |                                                                                     |                                                                                     | 40.8                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                     | D                                                                                   |                                                                                     |                                                                                     | D                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 12.0                                                                              | 74.9                                                                              | 16.1                                                                              | 26.9                                                                              | 30.5                                                                              | 56.5                                                                              |                                                                                     | 43.1                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 24.0                                                                              | 49.0                                                                              | 13.0                                                                              | 25.0                                                                              | 36.0                                                                              | 37.0                                                                              |                                                                                     | 43.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 8.3                                                                               | 43.5                                                                              | 11.1                                                                              | 21.5                                                                              | 25.0                                                                              | 31.1                                                                              |                                                                                     | 26.1                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.1                                                                               | 4.4                                                                               | 0.1                                                                               | 0.3                                                                               | 1.4                                                                               | 4.0                                                                               |                                                                                     | 2.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 40.4                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Notes</b>                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



---

## **APPENDIX C**

### LEVEL OF SERVICE CALCULATIONS

- Future Year 2022 Scenario 1 AM Peak
-

# HCM 2010 Signalized Intersection Summary

## 1: Honoapiilani Highway & Napilihau Street

08/16/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 50                                                                                | 45                                                                                | 295                                                                               | 90                                                                                | 50                                                                                | 20                                                                                | 225                                                                                | 235                                                                                 | 105                                                                                 | 10                                                                                  | 135                                                                                 | 30                                                                                  |
| Future Volume (veh/h)        | 50                                                                                | 45                                                                                | 295                                                                               | 90                                                                                | 50                                                                                | 20                                                                                | 225                                                                                | 235                                                                                 | 105                                                                                 | 10                                                                                  | 135                                                                                 | 30                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                  | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.99                                                                              | 0.99                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 54                                                                                | 49                                                                                | 42                                                                                | 98                                                                                | 54                                                                                | 11                                                                                | 245                                                                                | 255                                                                                 | 53                                                                                  | 11                                                                                  | 147                                                                                 | 8                                                                                   |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 238                                                                               | 165                                                                               | 258                                                                               | 327                                                                               | 247                                                                               | 50                                                                                | 327                                                                                | 794                                                                                 | 675                                                                                 | 15                                                                                  | 466                                                                                 | 396                                                                                 |
| Arrive On Green              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.16                                                                              | 0.18                                                                               | 0.43                                                                                | 0.43                                                                                | 0.01                                                                                | 0.25                                                                                | 0.25                                                                                |
| Sat Flow, veh/h              | 612                                                                               | 1000                                                                              | 1569                                                                              | 1291                                                                              | 1500                                                                              | 306                                                                               | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 103                                                                               | 0                                                                                 | 42                                                                                | 98                                                                                | 0                                                                                 | 65                                                                                | 245                                                                                | 255                                                                                 | 53                                                                                  | 11                                                                                  | 147                                                                                 | 8                                                                                   |
| Grp Sat Flow(s),veh/h/ln     | 1612                                                                              | 0                                                                                 | 1569                                                                              | 1291                                                                              | 0                                                                                 | 1806                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 0.5                                                                               | 0.0                                                                               | 0.9                                                                               | 2.9                                                                               | 0.0                                                                               | 1.2                                                                               | 5.2                                                                                | 3.6                                                                                 | 0.8                                                                                 | 0.2                                                                                 | 2.6                                                                                 | 0.2                                                                                 |
| Cycle Q Clear(g_c), s        | 2.0                                                                               | 0.0                                                                               | 0.9                                                                               | 4.9                                                                               | 0.0                                                                               | 1.2                                                                               | 5.2                                                                                | 3.6                                                                                 | 0.8                                                                                 | 0.2                                                                                 | 2.6                                                                                 | 0.2                                                                                 |
| Prop In Lane                 | 0.52                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.17                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 403                                                                               | 0                                                                                 | 258                                                                               | 327                                                                               | 0                                                                                 | 297                                                                               | 327                                                                                | 794                                                                                 | 675                                                                                 | 15                                                                                  | 466                                                                                 | 396                                                                                 |
| V/C Ratio(X)                 | 0.26                                                                              | 0.00                                                                              | 0.16                                                                              | 0.30                                                                              | 0.00                                                                              | 0.22                                                                              | 0.75                                                                               | 0.32                                                                                | 0.08                                                                                | 0.72                                                                                | 0.32                                                                                | 0.02                                                                                |
| Avail Cap(c_a), veh/h        | 1071                                                                              | 0                                                                                 | 943                                                                               | 890                                                                               | 0                                                                                 | 1085                                                                              | 1332                                                                               | 3684                                                                                | 3131                                                                                | 666                                                                                 | 2984                                                                                | 2537                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 14.8                                                                              | 0.0                                                                               | 14.3                                                                              | 17.0                                                                              | 0.0                                                                               | 14.5                                                                              | 15.4                                                                               | 7.6                                                                                 | 6.8                                                                                 | 19.8                                                                                | 12.2                                                                                | 11.3                                                                                |
| Incr Delay (d2), s/veh       | 0.3                                                                               | 0.0                                                                               | 0.3                                                                               | 0.5                                                                               | 0.0                                                                               | 0.4                                                                               | 3.4                                                                                | 0.5                                                                                 | 0.1                                                                                 | 47.2                                                                                | 0.8                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.0                                                                               | 0.0                                                                               | 0.4                                                                               | 1.1                                                                               | 0.0                                                                               | 0.6                                                                               | 2.8                                                                                | 2.0                                                                                 | 0.4                                                                                 | 0.3                                                                                 | 1.4                                                                                 | 0.1                                                                                 |
| LnGrp Delay(d),s/veh         | 15.1                                                                              | 0.0                                                                               | 14.6                                                                              | 17.5                                                                              | 0.0                                                                               | 14.8                                                                              | 18.8                                                                               | 8.1                                                                                 | 6.9                                                                                 | 67.0                                                                                | 13.0                                                                                | 11.3                                                                                |
| LnGrp LOS                    | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                  | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 145                                                                               |                                                                                   |                                                                                   | 163                                                                               |                                                                                   |                                                                                    | 553                                                                                 |                                                                                     |                                                                                     | 166                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 15.0                                                                              |                                                                                   |                                                                                   | 16.4                                                                              |                                                                                   |                                                                                    | 12.7                                                                                |                                                                                     |                                                                                     | 16.5                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.3                                                                               | 23.0                                                                              |                                                                                   | 11.6                                                                              | 12.4                                                                              | 16.0                                                                              |                                                                                    | 11.6                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 79.0                                                                              |                                                                                   | 24.0                                                                              | 30.0                                                                              | 64.0                                                                              |                                                                                    | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.2                                                                               | 5.6                                                                               |                                                                                   | 4.0                                                                               | 7.2                                                                               | 4.6                                                                               |                                                                                    | 6.9                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 3.8                                                                               |                                                                                   | 0.6                                                                               | 0.7                                                                               | 1.8                                                                               |                                                                                    | 0.6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 14.3                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 2: Honoapiilani Highway & Hoohui Road

08/16/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)        | 60                                                                                | 5                                                                                 | 180                                                                               | 90                                                                                | 20                                                                                | 15                                                                                | 140                                                                               | 535                                                                               | 15                                                                                | 10                                                                                  | 515                                                                                 | 65                                                                                  |
| Future Volume (veh/h)         | 60                                                                                | 5                                                                                 | 180                                                                               | 90                                                                                | 20                                                                                | 15                                                                                | 140                                                                               | 535                                                                               | 15                                                                                | 10                                                                                  | 515                                                                                 | 65                                                                                  |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                 | 2                                                                                 | 12                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 0.98                                                                              |                                                                                   | 0.97                                                                              | 0.98                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 0.99                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 65                                                                                | 5                                                                                 | 20                                                                                | 98                                                                                | 22                                                                                | 2                                                                                 | 152                                                                               | 582                                                                               | 0                                                                                 | 11                                                                                  | 560                                                                                 | 28                                                                                  |
| Adj No. of Lanes              | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 380                                                                               | 24                                                                                | 308                                                                               | 346                                                                               | 335                                                                               | 30                                                                                | 411                                                                               | 880                                                                               | 748                                                                               | 351                                                                                 | 725                                                                                 | 611                                                                                 |
| Arrive On Green               | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.09                                                                              | 0.47                                                                              | 0.00                                                                              | 0.01                                                                                | 0.39                                                                                | 0.39                                                                                |
| Sat Flow, veh/h               | 1209                                                                              | 122                                                                               | 1544                                                                              | 1351                                                                              | 1679                                                                              | 153                                                                               | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1571                                                                                |
| Grp Volume(v), veh/h          | 70                                                                                | 0                                                                                 | 20                                                                                | 98                                                                                | 0                                                                                 | 24                                                                                | 152                                                                               | 582                                                                               | 0                                                                                 | 11                                                                                  | 560                                                                                 | 28                                                                                  |
| Grp Sat Flow(s),veh/h/ln      | 1331                                                                              | 0                                                                                 | 1544                                                                              | 1351                                                                              | 0                                                                                 | 1831                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1571                                                                                |
| Q Serve(g_s), s               | 2.0                                                                               | 0.0                                                                               | 0.5                                                                               | 3.3                                                                               | 0.0                                                                               | 0.5                                                                               | 2.3                                                                               | 12.0                                                                              | 0.0                                                                               | 0.2                                                                                 | 13.2                                                                                | 0.6                                                                                 |
| Cycle Q Clear(g_c), s         | 2.5                                                                               | 0.0                                                                               | 0.5                                                                               | 5.8                                                                               | 0.0                                                                               | 0.5                                                                               | 2.3                                                                               | 12.0                                                                              | 0.0                                                                               | 0.2                                                                                 | 13.2                                                                                | 0.6                                                                                 |
| Prop In Lane                  | 0.93                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 405                                                                               | 0                                                                                 | 308                                                                               | 346                                                                               | 0                                                                                 | 366                                                                               | 411                                                                               | 880                                                                               | 748                                                                               | 351                                                                                 | 725                                                                                 | 611                                                                                 |
| V/C Ratio(X)                  | 0.17                                                                              | 0.00                                                                              | 0.06                                                                              | 0.28                                                                              | 0.00                                                                              | 0.07                                                                              | 0.37                                                                              | 0.66                                                                              | 0.00                                                                              | 0.03                                                                                | 0.77                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h         | 817                                                                               | 0                                                                                 | 771                                                                               | 751                                                                               | 0                                                                                 | 914                                                                               | 779                                                                               | 1897                                                                              | 1612                                                                              | 867                                                                                 | 1897                                                                                | 1600                                                                                |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 17.1                                                                              | 0.0                                                                               | 16.2                                                                              | 19.5                                                                              | 0.0                                                                               | 16.2                                                                              | 9.2                                                                               | 10.1                                                                              | 0.0                                                                               | 9.8                                                                                 | 13.4                                                                                | 9.5                                                                                 |
| Incr Delay (d2), s/veh        | 0.2                                                                               | 0.0                                                                               | 0.1                                                                               | 0.4                                                                               | 0.0                                                                               | 0.1                                                                               | 0.6                                                                               | 0.9                                                                               | 0.0                                                                               | 0.0                                                                                 | 1.8                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 0.8                                                                               | 0.0                                                                               | 0.2                                                                               | 1.3                                                                               | 0.0                                                                               | 0.3                                                                               | 1.2                                                                               | 6.4                                                                               | 0.0                                                                               | 0.1                                                                                 | 7.0                                                                                 | 0.2                                                                                 |
| LnGrp Delay(d),s/veh          | 17.3                                                                              | 0.0                                                                               | 16.3                                                                              | 20.0                                                                              | 0.0                                                                               | 16.3                                                                              | 9.8                                                                               | 11.0                                                                              | 0.0                                                                               | 9.8                                                                                 | 15.2                                                                                | 9.5                                                                                 |
| LnGrp LOS                     | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                 |                                                                                   | B                                                                                 | A                                                                                 | B                                                                                 |                                                                                   | A                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h           | 90                                                                                |                                                                                   |                                                                                   |                                                                                   | 122                                                                               |                                                                                   | 734                                                                               |                                                                                   |                                                                                   |                                                                                     | 599                                                                                 |                                                                                     |
| Approach Delay, s/veh         | 17.1                                                                              |                                                                                   |                                                                                   |                                                                                   | 19.2                                                                              |                                                                                   | 10.8                                                                              |                                                                                   |                                                                                   |                                                                                     | 14.8                                                                                |                                                                                     |
| Approach LOS                  | B                                                                                 |                                                                                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 5.4                                                                               | 29.7                                                                              |                                                                                   | 15.0                                                                              | 9.6                                                                               | 25.5                                                                              |                                                                                   | 15.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 15.0                                                                              | 51.0                                                                              |                                                                                   | 25.0                                                                              | 15.0                                                                              | 51.0                                                                              |                                                                                   | 25.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.2), s | 12.2                                                                              | 14.0                                                                              |                                                                                   | 4.5                                                                               | 4.3                                                                               | 15.2                                                                              |                                                                                   | 7.8                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.0                                                                               | 4.2                                                                               |                                                                                   | 0.4                                                                               | 0.3                                                                               | 4.1                                                                               |                                                                                   | 0.3                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           | 13.4                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 3: Honoapiilani Highway & Akahele Street

08/16/2017

|                                |  |  |  |  |  |  |  |   |    |   |  |  |
|--------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                       | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations            |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)         | 40                                                                                | 5                                                                                 | 125                                                                               | 40                                                                                | 15                                                                                | 30                                                                                | 60                                                                                | 600                                                                                | 25                                                                                  | 15                                                                                  | 715                                                                                 | 30                                                                                  |
| Future Volume (veh/h)          | 40                                                                                | 5                                                                                 | 125                                                                               | 40                                                                                | 15                                                                                | 30                                                                                | 60                                                                                | 600                                                                                | 25                                                                                  | 15                                                                                  | 715                                                                                 | 30                                                                                  |
| Number                         | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                 | 2                                                                                  | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)            | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                    | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln         | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h           | 43                                                                                | 5                                                                                 | 7                                                                                 | 43                                                                                | 16                                                                                | 1                                                                                 | 65                                                                                | 652                                                                                | 15                                                                                  | 16                                                                                  | 777                                                                                 | 17                                                                                  |
| Adj No. of Lanes               | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor               | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %           | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                     | 59                                                                                | 86                                                                                | 121                                                                               | 59                                                                                | 231                                                                               | 194                                                                               | 84                                                                                | 985                                                                                | 837                                                                                 | 20                                                                                  | 918                                                                                 | 780                                                                                 |
| Arrive On Green                | 0.03                                                                              | 0.12                                                                              | 0.12                                                                              | 0.03                                                                              | 0.12                                                                              | 0.12                                                                              | 0.05                                                                              | 0.53                                                                               | 0.53                                                                                | 0.01                                                                                | 0.49                                                                                | 0.49                                                                                |
| Sat Flow, veh/h                | 1774                                                                              | 698                                                                               | 977                                                                               | 1774                                                                              | 1863                                                                              | 1571                                                                              | 1774                                                                              | 1863                                                                               | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h           | 43                                                                                | 0                                                                                 | 12                                                                                | 43                                                                                | 16                                                                                | 1                                                                                 | 65                                                                                | 652                                                                                | 15                                                                                  | 16                                                                                  | 777                                                                                 | 17                                                                                  |
| Grp Sat Flow(s),veh/h/ln       | 1774                                                                              | 0                                                                                 | 1675                                                                              | 1774                                                                              | 1863                                                                              | 1571                                                                              | 1774                                                                              | 1863                                                                               | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Q Serve(g_s), s                | 1.6                                                                               | 0.0                                                                               | 0.4                                                                               | 1.6                                                                               | 0.5                                                                               | 0.0                                                                               | 2.4                                                                               | 16.8                                                                               | 0.3                                                                                 | 0.6                                                                                 | 24.0                                                                                | 0.4                                                                                 |
| Cycle Q Clear(g_c), s          | 1.6                                                                               | 0.0                                                                               | 0.4                                                                               | 1.6                                                                               | 0.5                                                                               | 0.0                                                                               | 2.4                                                                               | 16.8                                                                               | 0.3                                                                                 | 0.6                                                                                 | 24.0                                                                                | 0.4                                                                                 |
| Prop In Lane                   | 1.00                                                                              |                                                                                   | 0.58                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                    | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h         | 59                                                                                | 0                                                                                 | 207                                                                               | 59                                                                                | 231                                                                               | 194                                                                               | 84                                                                                | 985                                                                                | 837                                                                                 | 20                                                                                  | 918                                                                                 | 780                                                                                 |
| V/C Ratio(X)                   | 0.73                                                                              | 0.00                                                                              | 0.06                                                                              | 0.73                                                                              | 0.07                                                                              | 0.01                                                                              | 0.77                                                                              | 0.66                                                                               | 0.02                                                                                | 0.78                                                                                | 0.85                                                                                | 0.02                                                                                |
| Avail Cap(c_a), veh/h          | 537                                                                               | 0                                                                                 | 533                                                                               | 537                                                                               | 593                                                                               | 500                                                                               | 672                                                                               | 1834                                                                               | 1559                                                                                | 672                                                                                 | 1834                                                                                | 1559                                                                                |
| HCM Platoon Ratio              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)             | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh       | 31.6                                                                              | 0.0                                                                               | 25.5                                                                              | 31.6                                                                              | 25.6                                                                              | 25.4                                                                              | 31.1                                                                              | 11.3                                                                               | 7.4                                                                                 | 32.5                                                                                | 14.6                                                                                | 8.6                                                                                 |
| Incr Delay (d2), s/veh         | 16.1                                                                              | 0.0                                                                               | 0.1                                                                               | 16.1                                                                              | 0.1                                                                               | 0.0                                                                               | 13.6                                                                              | 0.8                                                                                | 0.0                                                                                 | 46.0                                                                                | 2.3                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh      | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln       | 1.0                                                                               | 0.0                                                                               | 0.2                                                                               | 1.0                                                                               | 0.3                                                                               | 0.0                                                                               | 1.5                                                                               | 8.7                                                                                | 0.1                                                                                 | 0.6                                                                                 | 12.7                                                                                | 0.2                                                                                 |
| LnGrp Delay(d),s/veh           | 47.7                                                                              | 0.0                                                                               | 25.6                                                                              | 47.7                                                                              | 25.7                                                                              | 25.4                                                                              | 44.7                                                                              | 12.1                                                                               | 7.4                                                                                 | 78.6                                                                                | 16.8                                                                                | 8.6                                                                                 |
| LnGrp LOS                      | D                                                                                 |                                                                                   | C                                                                                 | D                                                                                 | C                                                                                 | C                                                                                 | D                                                                                 | B                                                                                  | A                                                                                   | E                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h            | 55                                                                                |                                                                                   |                                                                                   |                                                                                   | 60                                                                                |                                                                                   |                                                                                   |                                                                                    | 732                                                                                 |                                                                                     | 810                                                                                 |                                                                                     |
| Approach Delay, s/veh          | 42.9                                                                              |                                                                                   |                                                                                   |                                                                                   | 41.5                                                                              |                                                                                   |                                                                                   |                                                                                    | 14.9                                                                                |                                                                                     | 17.9                                                                                |                                                                                     |
| Approach LOS                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                    | B                                                                                   |                                                                                     | B                                                                                   |                                                                                     |
| Timer                          | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                   | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s       | 5.8                                                                               | 39.9                                                                              | 7.2                                                                               | 13.2                                                                              | 8.1                                                                               | 37.5                                                                              | 7.2                                                                               | 13.2                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s        | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s    | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+12.6), s | 12.6                                                                              | 18.8                                                                              | 3.6                                                                               | 2.4                                                                               | 4.4                                                                               | 26.0                                                                              | 3.6                                                                               | 2.5                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s        | 0.0                                                                               | 5.1                                                                               | 0.1                                                                               | 0.0                                                                               | 0.1                                                                               | 6.6                                                                               | 0.1                                                                               | 0.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay            |                                                                                   |                                                                                   | 18.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 4: Honoapiilani Highway & Lower Honoapiilani Road

08/16/2017

| Movement                      | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations           |      | ↰    | ↱    |      | ↰    |      | ↰    | ↰    |      | ↰    | ↰    | ↰    |
| Traffic Volume (veh/h)        | 35   | 10   | 480  | 20   | 5    | 0    | 315  | 685  | 45   | 10   | 835  | 10   |
| Future Volume (veh/h)         | 35   | 10   | 480  | 20   | 5    | 0    | 315  | 685  | 45   | 10   | 835  | 10   |
| Number                        | 3    | 8    | 18   | 7    | 4    | 14   | 1    | 6    | 16   | 5    | 2    | 12   |
| Initial Q (Qb), veh           | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)           | 0.99 |      | 1.00 | 0.99 |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Parking Bus, Adj              | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln        | 1900 | 1863 | 1863 | 1900 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h          | 38   | 11   | 0    | 22   | 5    | 0    | 342  | 745  | 48   | 11   | 908  | 4    |
| Adj No. of Lanes              | 0    | 1    | 1    | 0    | 1    | 0    | 1    | 2    | 0    | 1    | 2    | 1    |
| Peak Hour Factor              | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, %          | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |
| Cap, veh/h                    | 193  | 31   | 116  | 198  | 31   | 0    | 410  | 2217 | 143  | 15   | 1537 | 687  |
| Arrive On Green               | 0.09 | 0.07 | 0.00 | 0.09 | 0.07 | 0.00 | 0.23 | 0.66 | 0.66 | 0.01 | 0.43 | 0.43 |
| Sat Flow, veh/h               | 1112 | 418  | 1583 | 1145 | 421  | 0    | 1774 | 3377 | 217  | 1774 | 3539 | 1583 |
| Grp Volume(v), veh/h          | 49   | 0    | 0    | 27   | 0    | 0    | 342  | 390  | 403  | 11   | 908  | 4    |
| Grp Sat Flow(s),veh/h/ln      | 1530 | 0    | 1583 | 1566 | 0    | 0    | 1774 | 1770 | 1824 | 1774 | 1770 | 1583 |
| Q Serve(g_s), s               | 0.8  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 10.5 | 5.6  | 5.6  | 0.4  | 11.2 | 0.1  |
| Cycle Q Clear(g_c), s         | 1.6  | 0.0  | 0.0  | 0.8  | 0.0  | 0.0  | 10.5 | 5.6  | 5.6  | 0.4  | 11.2 | 0.1  |
| Prop In Lane                  | 0.78 |      | 1.00 | 0.81 |      | 0.00 | 1.00 |      | 0.12 | 1.00 |      | 1.00 |
| Lane Grp Cap(c), veh/h        | 250  | 0    | 116  | 256  | 0    | 0    | 410  | 1162 | 1198 | 15   | 1537 | 687  |
| V/C Ratio(X)                  | 0.20 | 0.00 | 0.00 | 0.11 | 0.00 | 0.00 | 0.83 | 0.34 | 0.34 | 0.74 | 0.59 | 0.01 |
| Avail Cap(c_a), veh/h         | 916  | 0    | 829  | 836  | 0    | 0    | 2197 | 1760 | 1814 | 2197 | 3519 | 1574 |
| HCM Platoon Ratio             | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I)            | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh      | 25.0 | 0.0  | 0.0  | 24.6 | 0.0  | 0.0  | 21.0 | 4.3  | 4.3  | 28.4 | 12.3 | 9.2  |
| Incr Delay (d2), s/veh        | 0.4  | 0.0  | 0.0  | 0.2  | 0.0  | 0.0  | 1.7  | 0.4  | 0.4  | 22.8 | 0.8  | 0.0  |
| Initial Q Delay(d3),s/veh     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln      | 0.7  | 0.0  | 0.0  | 0.4  | 0.0  | 0.0  | 5.3  | 2.7  | 2.8  | 0.3  | 5.6  | 0.0  |
| LnGrp Delay(d),s/veh          | 25.3 | 0.0  | 0.0  | 24.8 | 0.0  | 0.0  | 22.7 | 4.7  | 4.7  | 51.1 | 13.1 | 9.2  |
| LnGrp LOS                     | C    |      |      | C    |      |      | C    | A    | A    | D    | B    | A    |
| Approach Vol, veh/h           | 49   |      |      | 27   |      |      | 1135 |      |      | 923  |      |      |
| Approach Delay, s/veh         | 25.3 |      |      | 24.8 |      |      | 10.1 |      |      | 13.6 |      |      |
| Approach LOS                  | C    |      |      | C    |      |      | B    |      |      | B    |      |      |
| Timer                         | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    |      |      |      |      |
| Assigned Phs                  | 1    | 2    |      | 4    | 5    | 6    |      | 8    |      |      |      |      |
| Phs Duration (G+Y+Rc), s      | 7.2  | 30.9 |      | 9.2  | 4.5  | 43.6 |      | 9.2  |      |      |      |      |
| Change Period (Y+Rc), s       | 4.0  | 6.0  |      | 5.0  | 4.0  | 6.0  |      | 5.0  |      |      |      |      |
| Max Green Setting (Gmax), s   | 71.0 | 57.0 |      | 27.0 | 71.0 | 57.0 |      | 30.0 |      |      |      |      |
| Max Q Clear Time (g_c+1.0), s | 12.5 | 13.2 |      | 2.8  | 2.4  | 7.6  |      | 3.6  |      |      |      |      |
| Green Ext Time (p_c), s       | 0.8  | 11.7 |      | 0.1  | 0.0  | 9.0  |      | 0.1  |      |      |      |      |
| <b>Intersection Summary</b>   |      |      |      |      |      |      |      |      |      |      |      |      |
| HCM 2010 Ctrl Delay           | 12.1 |      |      |      |      |      |      |      |      |      |      |      |
| HCM 2010 LOS                  | B    |      |      |      |      |      |      |      |      |      |      |      |

# HCM 2010 Signalized Intersection Summary

## 5: Honoapiilani Highway & Kai Malina Parkway/Halawai Drive

08/16/2017

|                              |                                                                                    |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
|------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                              |  |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Movement                     | EBL                                                                                | EBT                                                                               | EBR                                                                               | WBL  | WBT                                                                               | WBR  | NBL                                                                               | NBT                                                                               | NBR  | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                    |  |  |      |  |      |  |  |      |  |  |  |
| Traffic Volume (veh/h)       | 30                                                                                 | 0                                                                                 | 70                                                                                | 10   | 5                                                                                 | 10   | 135                                                                               | 1095                                                                              | 20   | 15                                                                                  | 1305                                                                                | 70                                                                                  |
| Future Volume (veh/h)        | 30                                                                                 | 0                                                                                 | 70                                                                                | 10   | 5                                                                                 | 10   | 135                                                                               | 1095                                                                              | 20   | 15                                                                                  | 1305                                                                                | 70                                                                                  |
| Number                       | 3                                                                                  | 8                                                                                 | 18                                                                                | 7    | 4                                                                                 | 14   | 1                                                                                 | 6                                                                                 | 16   | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                  | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                               |                                                                                   | 1.00                                                                              | 1.00 |                                                                                   | 1.00 | 1.00                                                                              |                                                                                   | 1.00 | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                               | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 33                                                                                 | 0                                                                                 | 1                                                                                 | 11   | 5                                                                                 | 1    | 147                                                                               | 1190                                                                              | 21   | 16                                                                                  | 1418                                                                                | 47                                                                                  |
| Adj No. of Lanes             | 0                                                                                  | 1                                                                                 | 1                                                                                 | 0    | 1                                                                                 | 0    | 1                                                                                 | 2                                                                                 | 0    | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                               | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                  | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 176                                                                                | 0                                                                                 | 72                                                                                | 118  | 19                                                                                | 3    | 186                                                                               | 2628                                                                              | 46   | 20                                                                                  | 2284                                                                                | 1022                                                                                |
| Arrive On Green              | 0.06                                                                               | 0.00                                                                              | 0.05                                                                              | 0.06 | 0.05                                                                              | 0.05 | 0.10                                                                              | 0.74                                                                              | 0.74 | 0.01                                                                                | 0.65                                                                                | 0.65                                                                                |
| Sat Flow, veh/h              | 1553                                                                               | 0                                                                                 | 1583                                                                              | 696  | 422                                                                               | 70   | 1774                                                                              | 3558                                                                              | 63   | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 33                                                                                 | 0                                                                                 | 1                                                                                 | 17   | 0                                                                                 | 0    | 147                                                                               | 592                                                                               | 619  | 16                                                                                  | 1418                                                                                | 47                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1553                                                                               | 0                                                                                 | 1583                                                                              | 1188 | 0                                                                                 | 0    | 1774                                                                              | 1770                                                                              | 1852 | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 0.0                                                                                | 0.0                                                                               | 0.0                                                                               | 0.4  | 0.0                                                                               | 0.0  | 5.5                                                                               | 9.0                                                                               | 9.0  | 0.6                                                                                 | 16.2                                                                                | 0.7                                                                                 |
| Cycle Q Clear(g_c), s        | 1.2                                                                                | 0.0                                                                               | 0.0                                                                               | 1.7  | 0.0                                                                               | 0.0  | 5.5                                                                               | 9.0                                                                               | 9.0  | 0.6                                                                                 | 16.2                                                                                | 0.7                                                                                 |
| Prop In Lane                 | 1.00                                                                               |                                                                                   | 1.00                                                                              | 0.65 |                                                                                   | 0.06 | 1.00                                                                              |                                                                                   | 0.03 | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 198                                                                                | 0                                                                                 | 72                                                                                | 158  | 0                                                                                 | 0    | 186                                                                               | 1307                                                                              | 1367 | 20                                                                                  | 2284                                                                                | 1022                                                                                |
| V/C Ratio(X)                 | 0.17                                                                               | 0.00                                                                              | 0.01                                                                              | 0.11 | 0.00                                                                              | 0.00 | 0.79                                                                              | 0.45                                                                              | 0.45 | 0.78                                                                                | 0.62                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h        | 607                                                                                | 0                                                                                 | 532                                                                               | 603  | 0                                                                                 | 0    | 545                                                                               | 2224                                                                              | 2328 | 285                                                                                 | 3932                                                                                | 1759                                                                                |
| HCM Platoon Ratio            | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                               | 0.00                                                                              | 1.00                                                                              | 1.00 | 0.00                                                                              | 0.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 31.3                                                                               | 0.0                                                                               | 31.2                                                                              | 31.7 | 0.0                                                                               | 0.0  | 29.9                                                                              | 3.5                                                                               | 3.5  | 33.7                                                                                | 7.2                                                                                 | 4.4                                                                                 |
| Incr Delay (d2), s/veh       | 0.1                                                                                | 0.0                                                                               | 0.0                                                                               | 0.1  | 0.0                                                                               | 0.0  | 2.9                                                                               | 0.5                                                                               | 0.5  | 21.1                                                                                | 0.6                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                                | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.6                                                                                | 0.0                                                                               | 0.0                                                                               | 0.3  | 0.0                                                                               | 0.0  | 2.8                                                                               | 4.5                                                                               | 4.7  | 0.4                                                                                 | 7.9                                                                                 | 0.3                                                                                 |
| LnGrp Delay(d),s/veh         | 31.4                                                                               | 0.0                                                                               | 31.2                                                                              | 31.8 | 0.0                                                                               | 0.0  | 32.8                                                                              | 4.0                                                                               | 4.0  | 54.8                                                                                | 7.8                                                                                 | 4.5                                                                                 |
| LnGrp LOS                    | C                                                                                  |                                                                                   | C                                                                                 | C    |                                                                                   |      | C                                                                                 | A                                                                                 | A    | D                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 34                                                                                 |                                                                                   |                                                                                   |      |                                                                                   | 17   |                                                                                   | 1358                                                                              |      | 1481                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 31.4                                                                               |                                                                                   |                                                                                   |      |                                                                                   | 31.8 |                                                                                   | 7.1                                                                               |      | 8.2                                                                                 |                                                                                     |                                                                                     |
| Approach LOS                 | C                                                                                  |                                                                                   |                                                                                   |      |                                                                                   | C    |                                                                                   | A                                                                                 |      | A                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                  | 2                                                                                 | 3                                                                                 | 4    | 5                                                                                 | 6    | 7                                                                                 | 8                                                                                 |      |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                  | 2                                                                                 |                                                                                   |      | 4                                                                                 | 5    | 6                                                                                 | 8                                                                                 |      |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 11.2                                                                               | 49.2                                                                              |                                                                                   |      | 8.1                                                                               | 4.8  | 55.5                                                                              | 8.1                                                                               |      |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                                | 5.0                                                                               |                                                                                   |      | 5.0                                                                               | 4.0  | 5.0                                                                               | 5.0                                                                               |      |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 21.0                                                                               | 76.0                                                                              |                                                                                   |      | 23.0                                                                              | 11.0 | 86.0                                                                              | 23.0                                                                              |      |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+17, s) | 17.5                                                                               | 18.2                                                                              |                                                                                   |      | 3.7                                                                               | 2.6  | 11.0                                                                              | 3.2                                                                               |      |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.1                                                                                | 25.9                                                                              |                                                                                   |      | 0.0                                                                               | 0.0  | 18.6                                                                              | 0.0                                                                               |      |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                    |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                    |                                                                                   | 8.1                                                                               |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                    |                                                                                   | A                                                                                 |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 6: Honoapiilani Highway & Kai Ala Drive/Puukolii Road

08/16/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)        | 55                                                                                | 5                                                                                 | 35                                                                                | 40                                                                                | 15                                                                                | 45                                                                                | 110                                                                               | 1235                                                                              | 60                                                                                | 30                                                                                  | 1250                                                                                | 45                                                                                  |
| Future Volume (veh/h)         | 55                                                                                | 5                                                                                 | 35                                                                                | 40                                                                                | 15                                                                                | 45                                                                                | 110                                                                               | 1235                                                                              | 60                                                                                | 30                                                                                  | 1250                                                                                | 45                                                                                  |
| Number                        | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 60                                                                                | 5                                                                                 | 1                                                                                 | 43                                                                                | 16                                                                                | 1                                                                                 | 120                                                                               | 1342                                                                              | 50                                                                                | 33                                                                                  | 1359                                                                                | 35                                                                                  |
| Adj No. of Lanes              | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 1                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 160                                                                               | 12                                                                                | 153                                                                               | 111                                                                               | 168                                                                               | 10                                                                                | 142                                                                               | 2768                                                                              | 1238                                                                              | 43                                                                                  | 2571                                                                                | 1150                                                                                |
| Arrive On Green               | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.08                                                                              | 0.78                                                                              | 0.78                                                                              | 0.02                                                                                | 0.73                                                                                | 0.73                                                                                |
| Sat Flow, veh/h               | 1193                                                                              | 120                                                                               | 1578                                                                              | 1401                                                                              | 1735                                                                              | 108                                                                               | 1774                                                                              | 3539                                                                              | 1583                                                                              | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h          | 65                                                                                | 0                                                                                 | 1                                                                                 | 43                                                                                | 0                                                                                 | 17                                                                                | 120                                                                               | 1342                                                                              | 50                                                                                | 33                                                                                  | 1359                                                                                | 35                                                                                  |
| Grp Sat Flow(s),veh/h/ln      | 1313                                                                              | 0                                                                                 | 1578                                                                              | 1401                                                                              | 0                                                                                 | 1843                                                                              | 1774                                                                              | 1770                                                                              | 1583                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s               | 6.6                                                                               | 0.0                                                                               | 0.1                                                                               | 4.7                                                                               | 0.0                                                                               | 1.3                                                                               | 10.3                                                                              | 20.6                                                                              | 1.1                                                                               | 2.9                                                                                 | 26.4                                                                                | 1.0                                                                                 |
| Cycle Q Clear(g_c), s         | 7.9                                                                               | 0.0                                                                               | 0.1                                                                               | 12.5                                                                              | 0.0                                                                               | 1.3                                                                               | 10.3                                                                              | 20.6                                                                              | 1.1                                                                               | 2.9                                                                                 | 26.4                                                                                | 1.0                                                                                 |
| Prop In Lane                  | 0.92                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 172                                                                               | 0                                                                                 | 153                                                                               | 111                                                                               | 0                                                                                 | 178                                                                               | 142                                                                               | 2768                                                                              | 1238                                                                              | 43                                                                                  | 2571                                                                                | 1150                                                                                |
| V/C Ratio(X)                  | 0.38                                                                              | 0.00                                                                              | 0.01                                                                              | 0.39                                                                              | 0.00                                                                              | 0.10                                                                              | 0.85                                                                              | 0.48                                                                              | 0.04                                                                              | 0.76                                                                                | 0.53                                                                                | 0.03                                                                                |
| Avail Cap(c_a), veh/h         | 254                                                                               | 0                                                                                 | 244                                                                               | 192                                                                               | 0                                                                                 | 285                                                                               | 240                                                                               | 2768                                                                              | 1238                                                                              | 240                                                                                 | 2571                                                                                | 1150                                                                                |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.73                                                                              | 0.73                                                                              | 0.73                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 67.3                                                                              | 0.0                                                                               | 63.3                                                                              | 72.8                                                                              | 0.0                                                                               | 63.8                                                                              | 70.4                                                                              | 5.9                                                                               | 3.8                                                                               | 75.2                                                                                | 9.4                                                                                 | 5.9                                                                                 |
| Incr Delay (d2), s/veh        | 1.4                                                                               | 0.0                                                                               | 0.0                                                                               | 2.2                                                                               | 0.0                                                                               | 0.2                                                                               | 3.9                                                                               | 0.4                                                                               | 0.0                                                                               | 9.7                                                                                 | 0.8                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 2.7                                                                               | 0.0                                                                               | 0.0                                                                               | 1.9                                                                               | 0.0                                                                               | 0.7                                                                               | 5.2                                                                               | 10.1                                                                              | 0.5                                                                               | 1.5                                                                                 | 13.1                                                                                | 0.4                                                                                 |
| LnGrp Delay(d),s/veh          | 68.7                                                                              | 0.0                                                                               | 63.3                                                                              | 75.0                                                                              | 0.0                                                                               | 64.1                                                                              | 74.2                                                                              | 6.4                                                                               | 3.8                                                                               | 84.8                                                                                | 10.2                                                                                | 6.0                                                                                 |
| LnGrp LOS                     | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                 | A                                                                                 | A                                                                                 | F                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h           |                                                                                   | 66                                                                                |                                                                                   |                                                                                   | 60                                                                                |                                                                                   |                                                                                   | 1512                                                                              |                                                                                   |                                                                                     | 1427                                                                                |                                                                                     |
| Approach Delay, s/veh         |                                                                                   | 68.6                                                                              |                                                                                   |                                                                                   | 71.9                                                                              |                                                                                   |                                                                                   | 11.7                                                                              |                                                                                   |                                                                                     | 11.8                                                                                |                                                                                     |
| Approach LOS                  |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 16.4                                                                              | 118.6                                                                             |                                                                                   | 20.0                                                                              | 7.8                                                                               | 127.2                                                                             |                                                                                   | 20.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 21.0                                                                              | 95.0                                                                              |                                                                                   | 24.0                                                                              | 21.0                                                                              | 95.0                                                                              |                                                                                   | 24.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1/3), s | 12.3                                                                              | 28.4                                                                              |                                                                                   | 14.5                                                                              | 4.9                                                                               | 22.6                                                                              |                                                                                   | 9.9                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.1                                                                               | 25.1                                                                              |                                                                                   | 0.1                                                                               | 0.0                                                                               | 25.5                                                                              |                                                                                   | 0.1                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           | 14.1                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 7: Honoapiilani Highway & Kaanapali Parkway/Halelo Street

08/16/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)        | 135                                                                               | 10                                                                                | 220                                                                               | 10                                                                                | 10                                                                                | 10                                                                                | 425                                                                               | 1315                                                                              | 15                                                                                | 80                                                                                  | 1210                                                                                | 100                                                                                 |
| Future Volume (veh/h)         | 135                                                                               | 10                                                                                | 220                                                                               | 10                                                                                | 10                                                                                | 10                                                                                | 425                                                                               | 1315                                                                              | 15                                                                                | 80                                                                                  | 1210                                                                                | 100                                                                                 |
| Number                        | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 155                                                                               | 0                                                                                 | 60                                                                                | 11                                                                                | 11                                                                                | 3                                                                                 | 462                                                                               | 1429                                                                              | 16                                                                                | 87                                                                                  | 1315                                                                                | 80                                                                                  |
| Adj No. of Lanes              | 2                                                                                 | 0                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 2                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 336                                                                               | 0                                                                                 | 825                                                                               | 62                                                                                | 62                                                                                | 17                                                                                | 612                                                                               | 2106                                                                              | 24                                                                                | 152                                                                                 | 1754                                                                                | 916                                                                                 |
| Arrive On Green               | 0.09                                                                              | 0.00                                                                              | 0.09                                                                              | 0.08                                                                              | 0.08                                                                              | 0.05                                                                              | 0.18                                                                              | 0.59                                                                              | 0.57                                                                              | 0.09                                                                                | 0.50                                                                                | 0.50                                                                                |
| Sat Flow, veh/h               | 3548                                                                              | 0                                                                                 | 3074                                                                              | 783                                                                               | 783                                                                               | 214                                                                               | 3442                                                                              | 3585                                                                              | 40                                                                                | 1774                                                                                | 3539                                                                                | 1578                                                                                |
| Grp Volume(v), veh/h          | 155                                                                               | 0                                                                                 | 60                                                                                | 25                                                                                | 0                                                                                 | 0                                                                                 | 462                                                                               | 705                                                                               | 740                                                                               | 87                                                                                  | 1315                                                                                | 80                                                                                  |
| Grp Sat Flow(s),veh/h/ln      | 1774                                                                              | 0                                                                                 | 1537                                                                              | 1780                                                                              | 0                                                                                 | 0                                                                                 | 1721                                                                              | 1770                                                                              | 1856                                                                              | 1774                                                                                | 1770                                                                                | 1578                                                                                |
| Q Serve(g_s), s               | 4.3                                                                               | 0.0                                                                               | 1.5                                                                               | 1.4                                                                               | 0.0                                                                               | 0.0                                                                               | 13.4                                                                              | 28.7                                                                              | 28.8                                                                              | 5.0                                                                                 | 31.3                                                                                | 2.4                                                                                 |
| Cycle Q Clear(g_c), s         | 4.3                                                                               | 0.0                                                                               | 1.5                                                                               | 1.4                                                                               | 0.0                                                                               | 0.0                                                                               | 13.4                                                                              | 28.7                                                                              | 28.8                                                                              | 5.0                                                                                 | 31.3                                                                                | 2.4                                                                                 |
| Prop In Lane                  | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.44                                                                              |                                                                                   | 0.12                                                                              | 1.00                                                                              |                                                                                   | 0.02                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 336                                                                               | 0                                                                                 | 825                                                                               | 142                                                                               | 0                                                                                 | 0                                                                                 | 612                                                                               | 1040                                                                              | 1090                                                                              | 152                                                                                 | 1754                                                                                | 916                                                                                 |
| V/C Ratio(X)                  | 0.46                                                                              | 0.00                                                                              | 0.07                                                                              | 0.18                                                                              | 0.00                                                                              | 0.00                                                                              | 0.75                                                                              | 0.68                                                                              | 0.68                                                                              | 0.57                                                                                | 0.75                                                                                | 0.09                                                                                |
| Avail Cap(c_a), veh/h         | 1148                                                                              | 0                                                                                 | 1529                                                                              | 525                                                                               | 0                                                                                 | 0                                                                                 | 1900                                                                              | 3268                                                                              | 3427                                                                              | 253                                                                                 | 5088                                                                                | 2403                                                                                |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 45.0                                                                              | 0.0                                                                               | 29.1                                                                              | 45.3                                                                              | 0.0                                                                               | 0.0                                                                               | 41.0                                                                              | 14.9                                                                              | 14.9                                                                              | 46.2                                                                                | 21.3                                                                                | 9.7                                                                                 |
| Incr Delay (d2), s/veh        | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 0.6                                                                               | 0.0                                                                               | 0.0                                                                               | 0.7                                                                               | 1.1                                                                               | 1.1                                                                               | 1.3                                                                                 | 0.9                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 2.1                                                                               | 0.0                                                                               | 0.7                                                                               | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 6.4                                                                               | 14.2                                                                              | 14.9                                                                              | 2.5                                                                                 | 15.4                                                                                | 1.2                                                                                 |
| LnGrp Delay(d),s/veh          | 45.4                                                                              | 0.0                                                                               | 29.1                                                                              | 45.9                                                                              | 0.0                                                                               | 0.0                                                                               | 41.7                                                                              | 16.0                                                                              | 15.9                                                                              | 47.4                                                                                | 22.2                                                                                | 9.8                                                                                 |
| LnGrp LOS                     | D                                                                                 |                                                                                   | C                                                                                 | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 | B                                                                                 | B                                                                                 | D                                                                                   | C                                                                                   | A                                                                                   |
| Approach Vol, veh/h           | 215                                                                               |                                                                                   | 25                                                                                |                                                                                   |                                                                                   |                                                                                   | 1907                                                                              |                                                                                   |                                                                                   | 1482                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 40.8                                                                              |                                                                                   | 45.9                                                                              |                                                                                   |                                                                                   |                                                                                   | 22.2                                                                              |                                                                                   |                                                                                   | 23.0                                                                                |                                                                                     |                                                                                     |
| Approach LOS                  | D                                                                                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                   |                                                                                     |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 22.7                                                                              | 56.0                                                                              |                                                                                   | 12.4                                                                              | 13.0                                                                              | 65.7                                                                              |                                                                                   | 13.9                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 6.0                                                                               | 6.0                                                                               |                                                                                   | 7.0                                                                               | 6.0                                                                               | 6.0                                                                               |                                                                                   | 7.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 56.0                                                                              | 149.0                                                                             |                                                                                   | 28.0                                                                              | 13.0                                                                              | 192.0                                                                             |                                                                                   | 31.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.5), s | 15.4                                                                              | 33.3                                                                              |                                                                                   | 3.4                                                                               | 7.0                                                                               | 30.8                                                                              |                                                                                   | 6.3                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 1.3                                                                               | 16.7                                                                              |                                                                                   | 0.0                                                                               | 0.1                                                                               | 16.6                                                                              |                                                                                   | 0.6                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           |                                                                                   |                                                                                   | 23.8                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 8: Honoapiilani Highway & Leialii Parkway

08/16/2017

|                               |                                                                                    |       |      |      |      |      |       |      |      |      |      |      |
|-------------------------------|------------------------------------------------------------------------------------|-------|------|------|------|------|-------|------|------|------|------|------|
|                               |  |       |      |      |      |      |       |      |      |      |      |      |
| Movement                      | EBL                                                                                | EBT   | EBR  | WBL  | WBT  | WBR  | NBL   | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations           |                                                                                    | ↔     |      | ↔    | ↔    |      | ↔     | ↔    |      | ↔    | ↔    |      |
| Traffic Volume (veh/h)        | 5                                                                                  | 5     | 5    | 60   | 0    | 45   | 5     | 1755 | 90   | 30   | 1410 | 5    |
| Future Volume (veh/h)         | 5                                                                                  | 5     | 5    | 60   | 0    | 45   | 5     | 1755 | 90   | 30   | 1410 | 5    |
| Number                        | 3                                                                                  | 8     | 18   | 7    | 4    | 14   | 1     | 6    | 16   | 5    | 2    | 12   |
| Initial Q (Qb), veh           | 0                                                                                  | 0     | 0    | 0    | 0    | 0    | 0     | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)           | 0.98                                                                               |       | 0.97 | 0.98 |      | 0.97 | 1.00  |      | 1.00 | 1.00 |      | 1.00 |
| Parking Bus, Adj              | 1.00                                                                               | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln        | 1900                                                                               | 1863  | 1900 | 1863 | 1863 | 1900 | 1863  | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h          | 5                                                                                  | 5     | 1    | 65   | 0    | 1    | 5     | 1908 | 96   | 33   | 1533 | 5    |
| Adj No. of Lanes              | 0                                                                                  | 1     | 0    | 1    | 1    | 0    | 1     | 2    | 0    | 1    | 2    | 0    |
| Peak Hour Factor              | 0.92                                                                               | 0.92  | 0.92 | 0.92 | 0.92 | 0.92 | 0.92  | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, %          | 2                                                                                  | 2     | 2    | 2    | 2    | 2    | 2     | 2    | 2    | 2    | 2    | 2    |
| Cap, veh/h                    | 90                                                                                 | 80    | 13   | 176  | 0    | 138  | 11    | 2707 | 135  | 63   | 2962 | 10   |
| Arrive On Green               | 0.09                                                                               | 0.09  | 0.08 | 0.09 | 0.00 | 0.08 | 0.01  | 0.79 | 0.78 | 0.04 | 0.82 | 0.81 |
| Sat Flow, veh/h               | 584                                                                                | 895   | 148  | 1372 | 0    | 1543 | 1774  | 3431 | 171  | 1774 | 3618 | 12   |
| Grp Volume(v), veh/h          | 11                                                                                 | 0     | 0    | 65   | 0    | 1    | 5     | 976  | 1028 | 33   | 750  | 788  |
| Grp Sat Flow(s),veh/h/ln      | 1627                                                                               | 0     | 0    | 1372 | 0    | 1543 | 1774  | 1770 | 1832 | 1774 | 1770 | 1861 |
| Q Serve(g_s), s               | 0.0                                                                                | 0.0   | 0.0  | 5.4  | 0.0  | 0.1  | 0.4   | 36.3 | 37.8 | 2.6  | 18.7 | 18.7 |
| Cycle Q Clear(g_c), s         | 0.8                                                                                | 0.0   | 0.0  | 6.1  | 0.0  | 0.1  | 0.4   | 36.3 | 37.8 | 2.6  | 18.7 | 18.7 |
| Prop In Lane                  | 0.45                                                                               |       | 0.09 | 1.00 |      | 1.00 | 1.00  |      | 0.09 | 1.00 |      | 0.01 |
| Lane Grp Cap(c), veh/h        | 183                                                                                | 0     | 0    | 176  | 0    | 138  | 11    | 1396 | 1446 | 63   | 1448 | 1523 |
| V/C Ratio(X)                  | 0.06                                                                               | 0.00  | 0.00 | 0.37 | 0.00 | 0.01 | 0.45  | 0.70 | 0.71 | 0.52 | 0.52 | 0.52 |
| Avail Cap(c_a), veh/h         | 312                                                                                | 0     | 0    | 289  | 0    | 265  | 101   | 1396 | 1446 | 101  | 1448 | 1523 |
| HCM Platoon Ratio             | 1.00                                                                               | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I)            | 1.00                                                                               | 0.00  | 0.00 | 1.00 | 0.00 | 1.00 | 0.63  | 0.63 | 0.63 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh      | 58.4                                                                               | 0.0   | 0.0  | 60.7 | 0.0  | 58.5 | 69.3  | 6.9  | 7.1  | 66.3 | 4.0  | 4.0  |
| Incr Delay (d2), s/veh        | 0.1                                                                                | 0.0   | 0.0  | 1.3  | 0.0  | 0.0  | 6.4   | 1.9  | 1.9  | 2.5  | 1.3  | 1.3  |
| Initial Q Delay(d3),s/veh     | 0.0                                                                                | 0.0   | 0.0  | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln      | 0.4                                                                                | 0.0   | 0.0  | 2.5  | 0.0  | 0.0  | 0.2   | 18.1 | 19.6 | 1.3  | 9.5  | 10.0 |
| LnGrp Delay(d),s/veh          | 58.6                                                                               | 0.0   | 0.0  | 62.0 | 0.0  | 58.6 | 75.8  | 8.8  | 9.0  | 68.8 | 5.3  | 5.3  |
| LnGrp LOS                     | E                                                                                  |       |      | E    |      | E    | E     | A    | A    | E    | A    | A    |
| Approach Vol, veh/h           | 11                                                                                 |       |      |      | 66   |      | 2009  |      |      |      | 1571 |      |
| Approach Delay, s/veh         | 58.6                                                                               |       |      |      | 62.0 |      | 9.1   |      |      |      | 6.6  |      |
| Approach LOS                  | E                                                                                  |       |      |      | E    |      | A     |      |      |      | A    |      |
| Timer                         | 1                                                                                  | 2     | 3    | 4    | 5    | 6    | 7     | 8    |      |      |      |      |
| Assigned Phs                  | 1                                                                                  | 2     |      |      | 4    | 5    | 6     | 8    |      |      |      |      |
| Phs Duration (G+Y+Rc), s      | 4.9                                                                                | 118.6 |      |      | 16.5 | 9.0  | 114.5 | 16.5 |      |      |      |      |
| Change Period (Y+Rc), s       | 4.0                                                                                | 5.0   |      |      | 5.0  | 4.0  | 5.0   | 5.0  |      |      |      |      |
| Max Green Setting (Gmax), s   | 95.0                                                                               | 95.0  |      |      | 23.0 | 8.0  | 95.0  | 23.0 |      |      |      |      |
| Max Q Clear Time (g_c+1/4), s | 20.7                                                                               | 20.7  |      |      | 8.1  | 4.6  | 39.8  | 2.8  |      |      |      |      |
| Green Ext Time (p_c), s       | 0.0                                                                                | 30.1  |      |      | 0.1  | 0.0  | 41.2  | 0.0  |      |      |      |      |
| Intersection Summary          |                                                                                    |       |      |      |      |      |       |      |      |      |      |      |
| HCM 2010 Ctrl Delay           |                                                                                    |       | 9.1  |      |      |      |       |      |      |      |      |      |
| HCM 2010 LOS                  |                                                                                    |       | A    |      |      |      |       |      |      |      |      |      |

# HCM 2010 Signalized Intersection Summary

## 9: Honoapiilani Highway & Front Street/Flemming Road

08/16/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                   |  |                                                                                   |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)        | 90                                                                                | 5                                                                                 | 5                                                                                 | 105                                                                               | 15                                                                                | 15                                                                                | 5                                                                                 | 1735                                                                              | 20                                                                                | 10                                                                                  | 1250                                                                                | 190                                                                                 |
| Future Volume (veh/h)         | 90                                                                                | 5                                                                                 | 5                                                                                 | 105                                                                               | 15                                                                                | 15                                                                                | 5                                                                                 | 1735                                                                              | 20                                                                                | 10                                                                                  | 1250                                                                                | 190                                                                                 |
| Number                        | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 98                                                                                | 5                                                                                 | 3                                                                                 | 114                                                                               | 16                                                                                | 12                                                                                | 5                                                                                 | 1886                                                                              | 21                                                                                | 11                                                                                  | 1359                                                                                | 147                                                                                 |
| Adj No. of Lanes              | 0                                                                                 | 1                                                                                 | 0                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 210                                                                               | 8                                                                                 | 5                                                                                 | 198                                                                               | 20                                                                                | 15                                                                                | 7                                                                                 | 2805                                                                              | 31                                                                                | 14                                                                                  | 2782                                                                                | 1245                                                                                |
| Arrive On Green               | 0.11                                                                              | 0.11                                                                              | 0.10                                                                              | 0.11                                                                              | 0.11                                                                              | 0.10                                                                              | 0.00                                                                              | 0.78                                                                              | 0.77                                                                              | 0.01                                                                                | 0.79                                                                                | 0.79                                                                                |
| Sat Flow, veh/h               | 1387                                                                              | 71                                                                                | 42                                                                                | 1312                                                                              | 184                                                                               | 138                                                                               | 1774                                                                              | 3585                                                                              | 40                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h          | 106                                                                               | 0                                                                                 | 0                                                                                 | 142                                                                               | 0                                                                                 | 0                                                                                 | 5                                                                                 | 929                                                                               | 978                                                                               | 11                                                                                  | 1359                                                                                | 147                                                                                 |
| Grp Sat Flow(s),veh/h/ln      | 1500                                                                              | 0                                                                                 | 0                                                                                 | 1634                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                              | 1770                                                                              | 1856                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 1.8                                                                               | 0.0                                                                               | 0.0                                                                               | 0.3                                                                               | 28.9                                                                              | 29.1                                                                              | 0.7                                                                                 | 16.0                                                                                | 2.6                                                                                 |
| Cycle Q Clear(g_c), s         | 7.9                                                                               | 0.0                                                                               | 0.0                                                                               | 9.8                                                                               | 0.0                                                                               | 0.0                                                                               | 0.3                                                                               | 28.9                                                                              | 29.1                                                                              | 0.7                                                                                 | 16.0                                                                                | 2.6                                                                                 |
| Prop In Lane                  | 0.92                                                                              |                                                                                   | 0.03                                                                              | 0.80                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                              |                                                                                   | 0.02                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 223                                                                               | 0                                                                                 | 0                                                                                 | 234                                                                               | 0                                                                                 | 0                                                                                 | 7                                                                                 | 1384                                                                              | 1452                                                                              | 14                                                                                  | 2782                                                                                | 1245                                                                                |
| V/C Ratio(X)                  | 0.48                                                                              | 0.00                                                                              | 0.00                                                                              | 0.61                                                                              | 0.00                                                                              | 0.00                                                                              | 0.73                                                                              | 0.67                                                                              | 0.67                                                                              | 0.81                                                                                | 0.49                                                                                | 0.12                                                                                |
| Avail Cap(c_a), veh/h         | 430                                                                               | 0                                                                                 | 0                                                                                 | 450                                                                               | 0                                                                                 | 0                                                                                 | 118                                                                               | 1384                                                                              | 1452                                                                              | 118                                                                                 | 2782                                                                                | 1245                                                                                |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.64                                                                              | 0.64                                                                              | 0.64                                                                              | 0.85                                                                                | 0.85                                                                                | 0.85                                                                                |
| Uniform Delay (d), s/veh      | 51.1                                                                              | 0.0                                                                               | 0.0                                                                               | 51.8                                                                              | 0.0                                                                               | 0.0                                                                               | 59.7                                                                              | 6.0                                                                               | 6.0                                                                               | 59.5                                                                                | 4.5                                                                                 | 3.0                                                                                 |
| Incr Delay (d2), s/veh        | 1.6                                                                               | 0.0                                                                               | 0.0                                                                               | 2.5                                                                               | 0.0                                                                               | 0.0                                                                               | 30.0                                                                              | 1.7                                                                               | 1.6                                                                               | 28.6                                                                                | 0.5                                                                                 | 0.2                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 8.5                                                                               | 0.0                                                                               | 0.0                                                                               | 4.7                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                               | 14.6                                                                              | 15.3                                                                              | 0.5                                                                                 | 7.9                                                                                 | 1.2                                                                                 |
| LnGrp Delay(d),s/veh          | 52.6                                                                              | 0.0                                                                               | 0.0                                                                               | 54.3                                                                              | 0.0                                                                               | 0.0                                                                               | 89.7                                                                              | 7.7                                                                               | 7.6                                                                               | 88.0                                                                                | 5.0                                                                                 | 3.2                                                                                 |
| LnGrp LOS                     | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | F                                                                                 | A                                                                                 | A                                                                                 | F                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h           |                                                                                   | 106                                                                               |                                                                                   |                                                                                   | 142                                                                               |                                                                                   |                                                                                   | 1912                                                                              |                                                                                   |                                                                                     | 1517                                                                                |                                                                                     |
| Approach Delay, s/veh         |                                                                                   | 52.6                                                                              |                                                                                   |                                                                                   | 54.3                                                                              |                                                                                   |                                                                                   | 7.9                                                                               |                                                                                   |                                                                                     | 5.4                                                                                 |                                                                                     |
| Approach LOS                  |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 4.5                                                                               | 98.3                                                                              |                                                                                   | 17.2                                                                              | 4.9                                                                               | 97.9                                                                              |                                                                                   | 17.2                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 68.0                                                                              | 68.0                                                                              |                                                                                   | 30.0                                                                              | 8.0                                                                               | 68.0                                                                              |                                                                                   | 30.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1/3), s | 12.3                                                                              | 18.0                                                                              |                                                                                   | 11.8                                                                              | 2.7                                                                               | 31.1                                                                              |                                                                                   | 9.9                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.0                                                                               | 31.8                                                                              |                                                                                   | 0.5                                                                               | 0.0                                                                               | 32.3                                                                              |                                                                                   | 0.3                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           | 9.9                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 10: Honoapiilani Highway & Kapunakea Street

08/16/2017

|                              |  |       |      |      |      |       |      |      |      |       |      |      |
|------------------------------|------------------------------------------------------------------------------------|-------|------|------|------|-------|------|------|------|-------|------|------|
| Movement                     | EBL                                                                                | EBT   | EBR  | WBL  | WBT  | WBR   | NBL  | NBT  | NBR  | SBL   | SBT  | SBR  |
| Lane Configurations          |                                                                                    | ↰     | ↱    | ↰    | ↱    |       | ↰    | ↱    |      | ↰     | ↱    |      |
| Traffic Volume (veh/h)       | 145                                                                                | 30    | 20   | 145  | 25   | 35    | 25   | 1555 | 75   | 10    | 1290 | 70   |
| Future Volume (veh/h)        | 145                                                                                | 30    | 20   | 145  | 25   | 35    | 25   | 1555 | 75   | 10    | 1290 | 70   |
| Number                       | 3                                                                                  | 8     | 18   | 7    | 4    | 14    | 1    | 6    | 16   | 5     | 2    | 12   |
| Initial Q (Qb), veh          | 0                                                                                  | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    | 0     | 0    | 0    |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                               |       | 0.98 | 0.99 |      | 0.98  | 1.00 |      | 1.00 | 1.00  |      | 1.00 |
| Parking Bus, Adj             | 1.00                                                                               | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln       | 1900                                                                               | 1863  | 1863 | 1863 | 1863 | 1900  | 1863 | 1863 | 1900 | 1863  | 1863 | 1900 |
| Adj Flow Rate, veh/h         | 158                                                                                | 33    | 2    | 158  | 27   | 5     | 27   | 1690 | 80   | 11    | 1402 | 73   |
| Adj No. of Lanes             | 0                                                                                  | 1     | 1    | 1    | 1    | 0     | 1    | 2    | 0    | 1     | 2    | 0    |
| Peak Hour Factor             | 0.92                                                                               | 0.92  | 0.92 | 0.92 | 0.92 | 0.92  | 0.92 | 0.92 | 0.92 | 0.92  | 0.92 | 0.92 |
| Percent Heavy Veh, %         | 2                                                                                  | 2     | 2    | 2    | 2    | 2     | 2    | 2    | 2    | 2     | 2    | 2    |
| Cap, veh/h                   | 229                                                                                | 38    | 265  | 307  | 259  | 48    | 34   | 2536 | 119  | 13    | 2483 | 129  |
| Arrive On Green              | 0.17                                                                               | 0.17  | 0.17 | 0.17 | 0.17 | 0.16  | 0.04 | 1.00 | 1.00 | 0.01  | 0.73 | 0.72 |
| Sat Flow, veh/h              | 1070                                                                               | 224   | 1558 | 1358 | 1525 | 282   | 1774 | 3442 | 162  | 1774  | 3423 | 178  |
| Grp Volume(v), veh/h         | 191                                                                                | 0     | 2    | 158  | 0    | 32    | 27   | 865  | 905  | 11    | 723  | 752  |
| Grp Sat Flow(s),veh/h/ln     | 1294                                                                               | 0     | 1558 | 1358 | 0    | 1807  | 1774 | 1770 | 1834 | 1774  | 1770 | 1831 |
| Q Serve(g_s), s              | 18.4                                                                               | 0.0   | 0.1  | 0.0  | 0.0  | 2.1   | 2.1  | 0.0  | 0.0  | 0.9   | 26.6 | 26.8 |
| Cycle Q Clear(g_c), s        | 20.5                                                                               | 0.0   | 0.1  | 13.4 | 0.0  | 2.1   | 2.1  | 0.0  | 0.0  | 0.9   | 26.6 | 26.8 |
| Prop In Lane                 | 0.83                                                                               |       | 1.00 | 1.00 |      | 0.16  | 1.00 |      | 0.09 | 1.00  |      | 0.10 |
| Lane Grp Cap(c), veh/h       | 267                                                                                | 0     | 265  | 307  | 0    | 307   | 34   | 1304 | 1352 | 13    | 1283 | 1328 |
| V/C Ratio(X)                 | 0.72                                                                               | 0.00  | 0.01 | 0.51 | 0.00 | 0.10  | 0.79 | 0.66 | 0.67 | 0.83  | 0.56 | 0.57 |
| Avail Cap(c_a), veh/h        | 310                                                                                | 0     | 312  | 348  | 0    | 361   | 139  | 1304 | 1352 | 139   | 1283 | 1328 |
| HCM Platoon Ratio            | 1.00                                                                               | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 2.00 | 2.00 | 2.00 | 1.00  | 1.00 | 1.00 |
| Upstream Filter(I)           | 1.00                                                                               | 0.00  | 1.00 | 1.00 | 0.00 | 1.00  | 0.50 | 0.50 | 0.50 | 0.85  | 0.85 | 0.85 |
| Uniform Delay (d), s/veh     | 57.8                                                                               | 0.0   | 48.3 | 53.8 | 0.0  | 49.2  | 67.0 | 0.0  | 0.0  | 69.4  | 8.9  | 9.0  |
| Incr Delay (d2), s/veh       | 6.5                                                                                | 0.0   | 0.0  | 1.3  | 0.0  | 0.1   | 7.6  | 1.3  | 1.3  | 32.3  | 1.5  | 1.5  |
| Initial Q Delay(d3),s/veh    | 0.0                                                                                | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln     | 7.7                                                                                | 0.0   | 0.1  | 5.8  | 0.0  | 1.1   | 1.1  | 0.5  | 0.5  | 0.5   | 13.4 | 13.9 |
| LnGrp Delay(d),s/veh         | 64.2                                                                               | 0.0   | 48.3 | 55.1 | 0.0  | 49.3  | 74.6 | 1.3  | 1.3  | 101.7 | 10.5 | 10.5 |
| LnGrp LOS                    | E                                                                                  |       | D    | E    |      | D     | E    | A    | A    | F     | B    | B    |
| Approach Vol, veh/h          | 193                                                                                |       |      | 190  |      |       | 1797 |      |      | 1486  |      |      |
| Approach Delay, s/veh        | 64.1                                                                               |       |      | 54.2 |      |       | 2.4  |      |      | 11.2  |      |      |
| Approach LOS                 | E                                                                                  |       |      | D    |      |       | A    |      |      | B     |      |      |
| Timer                        | 1                                                                                  | 2     | 3    | 4    | 5    | 6     | 7    | 8    |      |       |      |      |
| Assigned Phs                 | 1                                                                                  | 2     |      | 4    | 5    | 6     |      | 8    |      |       |      |      |
| Phs Duration (G+Y+Rc), s     | 6.7                                                                                | 105.5 |      | 27.8 | 5.0  | 107.2 |      | 27.8 |      |       |      |      |
| Change Period (Y+Rc), s      | 4.0                                                                                | 5.0   |      | 5.0  | 4.0  | 5.0   |      | 5.0  |      |       |      |      |
| Max Green Setting (Gmax), s  | 11.0                                                                               | 88.0  |      | 27.0 | 11.0 | 88.0  |      | 27.0 |      |       |      |      |
| Max Q Clear Time (g_c+14), s | 14.1                                                                               | 28.8  |      | 15.4 | 2.9  | 2.0   |      | 22.5 |      |       |      |      |
| Green Ext Time (p_c), s      | 0.0                                                                                | 25.7  |      | 0.5  | 0.0  | 43.3  |      | 0.3  |      |       |      |      |
| <b>Intersection Summary</b>  |                                                                                    |       |      |      |      |       |      |      |      |       |      |      |
| HCM 2010 Ctrl Delay          | 11.9                                                                               |       |      |      |      |       |      |      |      |       |      |      |
| HCM 2010 LOS                 | B                                                                                  |       |      |      |      |       |      |      |      |       |      |      |

# HCM 2010 Signalized Intersection Summary

## 11: Honoapiilani Highway & Keawe Street

08/16/2017

|                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                              |  |  |  |  |  |  |  |  |   |  |  |  |
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                                | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 15                                                                                | 110                                                                               | 35                                                                                | 95                                                                                | 75                                                                                | 715                                                                               | 25                                                                                | 870                                                                               | 120                                                                                | 520                                                                                 | 870                                                                                 | 20                                                                                  |
| Future Volume (veh/h)        | 15                                                                                | 110                                                                               | 35                                                                                | 95                                                                                | 75                                                                                | 715                                                                               | 25                                                                                | 870                                                                               | 120                                                                                | 520                                                                                 | 870                                                                                 | 20                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                 | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.99                                                                              | 0.99                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 16                                                                                | 120                                                                               | 5                                                                                 | 103                                                                               | 82                                                                                | 438                                                                               | 27                                                                                | 946                                                                               | 54                                                                                 | 565                                                                                 | 946                                                                                 | 21                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 2                                                                                 | 1                                                                                  | 2                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 52                                                                                | 341                                                                               | 327                                                                               | 353                                                                               | 566                                                                               | 477                                                                               | 34                                                                                | 1524                                                                              | 679                                                                                | 619                                                                                 | 2093                                                                                | 46                                                                                  |
| Arrive On Green              | 0.21                                                                              | 0.21                                                                              | 0.21                                                                              | 0.07                                                                              | 0.30                                                                              | 0.30                                                                              | 0.02                                                                              | 0.43                                                                              | 0.43                                                                               | 0.36                                                                                | 1.00                                                                                | 1.00                                                                                |
| Sat Flow, veh/h              | 110                                                                               | 1628                                                                              | 1563                                                                              | 1774                                                                              | 1863                                                                              | 1569                                                                              | 1774                                                                              | 3539                                                                              | 1576                                                                               | 3442                                                                                | 3540                                                                                | 79                                                                                  |
| Grp Volume(v), veh/h         | 136                                                                               | 0                                                                                 | 5                                                                                 | 103                                                                               | 82                                                                                | 438                                                                               | 27                                                                                | 946                                                                               | 54                                                                                 | 565                                                                                 | 473                                                                                 | 494                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1738                                                                              | 0                                                                                 | 1563                                                                              | 1774                                                                              | 1863                                                                              | 1569                                                                              | 1774                                                                              | 1770                                                                              | 1576                                                                               | 1721                                                                                | 1770                                                                                | 1849                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 6.1                                                                               | 4.5                                                                               | 37.7                                                                              | 2.1                                                                               | 29.1                                                                              | 2.8                                                                                | 21.9                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Cycle Q Clear(g_c), s        | 8.7                                                                               | 0.0                                                                               | 0.4                                                                               | 6.1                                                                               | 4.5                                                                               | 37.7                                                                              | 2.1                                                                               | 29.1                                                                              | 2.8                                                                                | 21.9                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Prop In Lane                 | 0.12                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                               | 1.00                                                                                |                                                                                     | 0.04                                                                                |
| Lane Grp Cap(c), veh/h       | 392                                                                               | 0                                                                                 | 327                                                                               | 353                                                                               | 566                                                                               | 477                                                                               | 34                                                                                | 1524                                                                              | 679                                                                                | 619                                                                                 | 1046                                                                                | 1093                                                                                |
| V/C Ratio(X)                 | 0.35                                                                              | 0.00                                                                              | 0.02                                                                              | 0.29                                                                              | 0.14                                                                              | 0.92                                                                              | 0.79                                                                              | 0.62                                                                              | 0.08                                                                               | 0.91                                                                                | 0.45                                                                                | 0.45                                                                                |
| Avail Cap(c_a), veh/h        | 392                                                                               | 0                                                                                 | 327                                                                               | 527                                                                               | 665                                                                               | 560                                                                               | 177                                                                               | 1524                                                                              | 679                                                                                | 836                                                                                 | 1046                                                                                | 1093                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.79                                                                              | 0.79                                                                              | 0.79                                                                               | 0.73                                                                                | 0.73                                                                                | 0.73                                                                                |
| Uniform Delay (d), s/veh     | 47.2                                                                              | 0.0                                                                               | 43.9                                                                              | 38.0                                                                              | 35.5                                                                              | 47.1                                                                              | 68.4                                                                              | 31.0                                                                              | 23.5                                                                               | 43.8                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Incr Delay (d2), s/veh       | 0.5                                                                               | 0.0                                                                               | 0.0                                                                               | 0.5                                                                               | 0.1                                                                               | 18.6                                                                              | 11.4                                                                              | 1.5                                                                               | 0.2                                                                                | 7.5                                                                                 | 1.0                                                                                 | 1.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 4.6                                                                               | 0.0                                                                               | 0.2                                                                               | 3.0                                                                               | 2.3                                                                               | 18.8                                                                              | 1.2                                                                               | 14.5                                                                              | 1.3                                                                                | 11.0                                                                                | 0.3                                                                                 | 0.3                                                                                 |
| LnGrp Delay(d),s/veh         | 47.7                                                                              | 0.0                                                                               | 43.9                                                                              | 38.4                                                                              | 35.6                                                                              | 65.7                                                                              | 79.8                                                                              | 32.5                                                                              | 23.7                                                                               | 51.3                                                                                | 1.0                                                                                 | 1.0                                                                                 |
| LnGrp LOS                    | D                                                                                 |                                                                                   | D                                                                                 | D                                                                                 | D                                                                                 | E                                                                                 | E                                                                                 | C                                                                                 | C                                                                                  | D                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 141                                                                               |                                                                                   |                                                                                   | 623                                                                               |                                                                                   |                                                                                   | 1027                                                                              |                                                                                    |                                                                                     | 1532                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 47.6                                                                              |                                                                                   |                                                                                   | 57.2                                                                              |                                                                                   |                                                                                   | 33.3                                                                              |                                                                                    |                                                                                     | 19.6                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                    |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 6.7                                                                               | 86.8                                                                              | 13.2                                                                              | 33.3                                                                              | 29.2                                                                              | 64.3                                                                              |                                                                                   | 46.5                                                                              |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 14.0                                                                              | 63.0                                                                              | 22.0                                                                              | 22.0                                                                              | 34.0                                                                              | 43.0                                                                              |                                                                                   | 49.0                                                                              |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+14), s | 14.0                                                                              | 2.0                                                                               | 8.1                                                                               | 10.7                                                                              | 23.9                                                                              | 31.1                                                                              |                                                                                   | 39.7                                                                              |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 12.3                                                                              | 0.3                                                                               | 0.4                                                                               | 1.3                                                                               | 6.7                                                                               |                                                                                   | 1.8                                                                               |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 32.0                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |

HCM 2010 TWSC  
12: RIRO Access & Honoapiilani Highway

08/16/2017

| Intersection             |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
|--------------------------|--------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh         | 0      |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
| Movement                 | WBL    | WBR                                                                               | NBT                                                                               | NBR                                                                               | SBL    | SBT                                                                                 |
| Lane Configurations      |        |  |  |  |        |  |
| Traffic Vol, veh/h       | 0      | 0                                                                                 | 670                                                                               | 0                                                                                 | 0      | 790                                                                                 |
| Future Vol, veh/h        | 0      | 0                                                                                 | 670                                                                               | 0                                                                                 | 0      | 790                                                                                 |
| Conflicting Peds, #/hr   | 0      | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0      | 0                                                                                   |
| Sign Control             | Stop   | Stop                                                                              | Free                                                                              | Free                                                                              | Free   | Free                                                                                |
| RT Channelized           | -      | None                                                                              | -                                                                                 | None                                                                              | -      | None                                                                                |
| Storage Length           | -      | 0                                                                                 | -                                                                                 | 0                                                                                 | -      | -                                                                                   |
| Veh in Median Storage, # | 0      | -                                                                                 | 0                                                                                 | -                                                                                 | -      | 0                                                                                   |
| Grade, %                 | 0      | -                                                                                 | 0                                                                                 | -                                                                                 | -      | 0                                                                                   |
| Peak Hour Factor         | 92     | 92                                                                                | 92                                                                                | 92                                                                                | 92     | 92                                                                                  |
| Heavy Vehicles, %        | 2      | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2      | 2                                                                                   |
| Mvmt Flow                | 0      | 0                                                                                 | 728                                                                               | 0                                                                                 | 0      | 859                                                                                 |
|                          |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
| Major/Minor              | Minor1 |                                                                                   | Major1                                                                            |                                                                                   | Major2 |                                                                                     |
| Conflicting Flow All     | -      | 728                                                                               | 0                                                                                 | 0                                                                                 | -      | -                                                                                   |
| Stage 1                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Stage 2                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Critical Hdwy            | -      | 6.22                                                                              | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Critical Hdwy Stg 1      | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Critical Hdwy Stg 2      | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Follow-up Hdwy           | -      | 3.318                                                                             | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Pot Cap-1 Maneuver       | 0      | 423                                                                               | -                                                                                 | -                                                                                 | 0      | -                                                                                   |
| Stage 1                  | 0      | -                                                                                 | -                                                                                 | -                                                                                 | 0      | -                                                                                   |
| Stage 2                  | 0      | -                                                                                 | -                                                                                 | -                                                                                 | 0      | -                                                                                   |
| Platoon blocked, %       |        |                                                                                   | -                                                                                 | -                                                                                 |        | -                                                                                   |
| Mov Cap-1 Maneuver       | -      | 423                                                                               | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Mov Cap-2 Maneuver       | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Stage 1                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Stage 2                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
|                          |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
|                          |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
| Approach                 | WB     |                                                                                   | NB                                                                                |                                                                                   | SB     |                                                                                     |
| HCM Control Delay, s     | 0      |                                                                                   | 0                                                                                 |                                                                                   | 0      |                                                                                     |
| HCM LOS                  | A      |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
|                          |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
| Minor Lane/Major Mvmt    | NBT    | NBRWBLn1                                                                          | SBT                                                                               |                                                                                   |        |                                                                                     |
| Capacity (veh/h)         | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| HCM Lane V/C Ratio       | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| HCM Control Delay (s)    | -      | -                                                                                 | 0                                                                                 | -                                                                                 | -      | -                                                                                   |
| HCM Lane LOS             | -      | -                                                                                 | A                                                                                 | -                                                                                 | -      | -                                                                                   |
| HCM 95th %tile O(veh)    | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |

HCM 2010 TWSC  
13: Honoapiilani Highway & Road J

08/16/2017

| Intersection             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh         | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Movement                 | WBL                                                                               | WBR                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 |
| Lane Configurations      |  |  |  |  |  |  |
| Traffic Vol, veh/h       | 0                                                                                 | 0                                                                                 | 715                                                                               | 0                                                                                 | 0                                                                                   | 875                                                                                 |
| Future Vol, veh/h        | 0                                                                                 | 0                                                                                 | 715                                                                               | 0                                                                                 | 0                                                                                   | 875                                                                                 |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   |
| Sign Control             | Stop                                                                              | Stop                                                                              | Free                                                                              | Free                                                                              | Free                                                                                | Free                                                                                |
| RT Channelized           | -                                                                                 | None                                                                              | -                                                                                 | None                                                                              | -                                                                                   | None                                                                                |
| Storage Length           | 0                                                                                 | 100                                                                               | -                                                                                 | 100                                                                               | 100                                                                                 | -                                                                                   |
| Veh in Median Storage, # | 0                                                                                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                   | 0                                                                                   |
| Grade, %                 | 0                                                                                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                   | 0                                                                                   |
| Peak Hour Factor         | 92                                                                                | 92                                                                                | 92                                                                                | 92                                                                                | 92                                                                                  | 92                                                                                  |
| Heavy Vehicles, %        | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   |
| Mvmt Flow                | 0                                                                                 | 0                                                                                 | 777                                                                               | 0                                                                                 | 0                                                                                   | 951                                                                                 |
| Major/Minor              | Minor1                                                                            | Major1                                                                            |                                                                                   | Major2                                                                            |                                                                                     |                                                                                     |
| Conflicting Flow All     | 1728                                                                              | 777                                                                               | 0                                                                                 | 0                                                                                 | 777                                                                                 | 0                                                                                   |
| Stage 1                  | 777                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 2                  | 951                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Critical Hdwy            | 6.42                                                                              | 6.22                                                                              | -                                                                                 | -                                                                                 | 4.12                                                                                | -                                                                                   |
| Critical Hdwy Stg 1      | 5.42                                                                              | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Critical Hdwy Stg 2      | 5.42                                                                              | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Follow-up Hdwy           | 3.518                                                                             | 3.318                                                                             | -                                                                                 | -                                                                                 | 2.218                                                                               | -                                                                                   |
| Pot Cap-1 Maneuver       | 97                                                                                | 397                                                                               | -                                                                                 | -                                                                                 | 839                                                                                 | -                                                                                   |
| Stage 1                  | 453                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 2                  | 375                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Platoon blocked, %       |                                                                                   |                                                                                   | -                                                                                 | -                                                                                 |                                                                                     | -                                                                                   |
| Mov Cap-1 Maneuver       | 97                                                                                | 397                                                                               | -                                                                                 | -                                                                                 | 839                                                                                 | -                                                                                   |
| Mov Cap-2 Maneuver       | 231                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 1                  | 453                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 2                  | 375                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Approach                 | WB                                                                                | NB                                                                                |                                                                                   | SB                                                                                |                                                                                     |                                                                                     |
| HCM Control Delay, s     | 0                                                                                 | 0                                                                                 |                                                                                   | 0                                                                                 |                                                                                     |                                                                                     |
| HCM LOS                  | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Minor Lane/Major Mvmt    | NBT                                                                               | NBRWBLn1WBLn2                                                                     | SBL                                                                               | SBT                                                                               |                                                                                     |                                                                                     |
| Capacity (veh/h)         | -                                                                                 | -                                                                                 | -                                                                                 | 839                                                                               | -                                                                                   |                                                                                     |
| HCM Lane V/C Ratio       | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   |                                                                                     |
| HCM Control Delay (s)    | -                                                                                 | -                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   |                                                                                     |
| HCM Lane LOS             | -                                                                                 | -                                                                                 | A                                                                                 | A                                                                                 | A                                                                                   |                                                                                     |
| HCM 95th %tile Q(veh)    | -                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -                                                                                   |                                                                                     |

HCM 2010 TWSC  
14: Road A & Akahele Street

08/16/2017

| Intersection             |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|--------|-------------------------------------------------------------------------------------|-------|--------|-------------------------------------------------------------------------------------|-------|
| Int Delay, s/veh         | 3.4                                                                               |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Movement                 | EBL                                                                               | EBT                                                                               | EBR  | WBL                                                                               | WBT                                                                               | WBR  | NBL    | NBT                                                                                 | NBR   | SBL    | SBT                                                                                 | SBR   |
| Lane Configurations      |  |  |      |  |  |      |        |  |       |        |  |       |
| Traffic Vol, veh/h       | 5                                                                                 | 30                                                                                | 5    | 5                                                                                 | 55                                                                                | 5    | 10     | 5                                                                                   | 5     | 5      | 5                                                                                   | 20    |
| Future Vol, veh/h        | 5                                                                                 | 30                                                                                | 5    | 5                                                                                 | 55                                                                                | 5    | 10     | 5                                                                                   | 5     | 5      | 5                                                                                   | 20    |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0      | 0                                                                                   | 0     | 0      | 0                                                                                   | 0     |
| Sign Control             | Free                                                                              | Free                                                                              | Free | Free                                                                              | Free                                                                              | Free | Stop   | Stop                                                                                | Stop  | Stop   | Stop                                                                                | Stop  |
| RT Channelized           | -                                                                                 | -                                                                                 | None | -                                                                                 | -                                                                                 | None | -      | -                                                                                   | None  | -      | -                                                                                   | None  |
| Storage Length           | 100                                                                               | -                                                                                 | -    | 100                                                                               | -                                                                                 | -    | -      | -                                                                                   | -     | -      | -                                                                                   | -     |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | -    | -                                                                                 | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Grade, %                 | -                                                                                 | 0                                                                                 | -    | -                                                                                 | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Peak Hour Factor         | 92                                                                                | 92                                                                                | 92   | 92                                                                                | 92                                                                                | 92   | 92     | 92                                                                                  | 92    | 92     | 92                                                                                  | 92    |
| Heavy Vehicles, %        | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    | 2      | 2                                                                                   | 2     | 2      | 2                                                                                   | 2     |
| Mvmt Flow                | 5                                                                                 | 33                                                                                | 5    | 5                                                                                 | 60                                                                                | 5    | 11     | 5                                                                                   | 5     | 5      | 5                                                                                   | 22    |
|                          |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Major/Minor              | Major1                                                                            |                                                                                   |      | Major2                                                                            |                                                                                   |      | Minor1 |                                                                                     |       | Minor2 |                                                                                     |       |
| Conflicting Flow All     | 65                                                                                | 0                                                                                 | 0    | 38                                                                                | 0                                                                                 | 0    | 132    | 121                                                                                 | 36    | 124    | 121                                                                                 | 63    |
| Stage 1                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 46     | 46                                                                                  | -     | 73     | 73                                                                                  | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 86     | 75                                                                                  | -     | 51     | 48                                                                                  | -     |
| Critical Hdwy            | 4.12                                                                              | -                                                                                 | -    | 4.12                                                                              | -                                                                                 | -    | 7.12   | 6.52                                                                                | 6.22  | 7.12   | 6.52                                                                                | 6.22  |
| Critical Hdwy Stg 1      | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Critical Hdwy Stg 2      | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Follow-up Hdwy           | 2.218                                                                             | -                                                                                 | -    | 2.218                                                                             | -                                                                                 | -    | 3.518  | 4.018                                                                               | 3.318 | 3.518  | 4.018                                                                               | 3.318 |
| Pot Cap-1 Maneuver       | 1537                                                                              | -                                                                                 | -    | 1572                                                                              | -                                                                                 | -    | 840    | 769                                                                                 | 1037  | 850    | 769                                                                                 | 1002  |
| Stage 1                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 968    | 857                                                                                 | -     | 937    | 834                                                                                 | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 922    | 833                                                                                 | -     | 962    | 855                                                                                 | -     |
| Platoon blocked, %       |                                                                                   | -                                                                                 | -    |                                                                                   | -                                                                                 | -    |        |                                                                                     |       |        |                                                                                     |       |
| Mov Cap-1 Maneuver       | 1537                                                                              | -                                                                                 | -    | 1572                                                                              | -                                                                                 | -    | 813    | 764                                                                                 | 1037  | 837    | 764                                                                                 | 1002  |
| Mov Cap-2 Maneuver       | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 813    | 764                                                                                 | -     | 837    | 764                                                                                 | -     |
| Stage 1                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 965    | 854                                                                                 | -     | 934    | 831                                                                                 | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 893    | 831                                                                                 | -     | 948    | 852                                                                                 | -     |
|                          |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Approach                 | EB                                                                                |                                                                                   |      | WB                                                                                |                                                                                   |      | NB     |                                                                                     |       | SB     |                                                                                     |       |
| HCM Control Delay, s     | 0.9                                                                               |                                                                                   |      | 0.6                                                                               |                                                                                   |      | 9.4    |                                                                                     |       | 9      |                                                                                     |       |
| HCM LOS                  |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      | A      |                                                                                     |       | A      |                                                                                     |       |
|                          |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Minor Lane/Major Mvmt    | NBLn1                                                                             | EBL                                                                               | EBT  | EBR                                                                               | WBL                                                                               | WBT  | WBR    | SBLn1                                                                               |       |        |                                                                                     |       |
| Capacity (veh/h)         | 845                                                                               | 1537                                                                              | -    | -                                                                                 | 1572                                                                              | -    | -      | 924                                                                                 |       |        |                                                                                     |       |
| HCM Lane V/C Ratio       | 0.026                                                                             | 0.004                                                                             | -    | -                                                                                 | 0.003                                                                             | -    | -      | 0.035                                                                               |       |        |                                                                                     |       |
| HCM Control Delay (s)    | 9.4                                                                               | 7.4                                                                               | -    | -                                                                                 | 7.3                                                                               | -    | -      | 9                                                                                   |       |        |                                                                                     |       |
| HCM Lane LOS             | A                                                                                 | A                                                                                 | -    | -                                                                                 | A                                                                                 | -    | -      | A                                                                                   |       |        |                                                                                     |       |
| HCM 95th %tile O(veh)    | 0.1                                                                               | 0                                                                                 | -    | -                                                                                 | 0                                                                                 | -    | -      | 0.1                                                                                 |       |        |                                                                                     |       |



| Intersection             |        |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
|--------------------------|--------|-----------------------------------------------------------------------------------|------|--------|-----------------------------------------------------------------------------------|------|--------|-------------------------------------------------------------------------------------|-------|--------|-------------------------------------------------------------------------------------|-------|
| Int Delay, s/veh         | 4.2    |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Movement                 | EBL    | EBT                                                                               | EBR  | WBL    | WBT                                                                               | WBR  | NBL    | NBT                                                                                 | NBR   | SBL    | SBT                                                                                 | SBR   |
| Lane Configurations      |        |  |      |        |  |      |        |  |       |        |  |       |
| Traffic Vol, veh/h       | 5      | 20                                                                                | 10   | 5      | 10                                                                                | 5    | 0      | 5                                                                                   | 5     | 5      | 5                                                                                   | 15    |
| Future Vol, veh/h        | 5      | 20                                                                                | 10   | 5      | 10                                                                                | 5    | 0      | 5                                                                                   | 5     | 5      | 5                                                                                   | 15    |
| Conflicting Peds, #/hr   | 0      | 0                                                                                 | 0    | 0      | 0                                                                                 | 0    | 0      | 0                                                                                   | 0     | 0      | 0                                                                                   | 0     |
| Sign Control             | Free   | Free                                                                              | Free | Free   | Free                                                                              | Free | Stop   | Stop                                                                                | Stop  | Stop   | Stop                                                                                | Stop  |
| RT Channelized           | -      | -                                                                                 | None | -      | -                                                                                 | None | -      | -                                                                                   | None  | -      | -                                                                                   | None  |
| Storage Length           | -      | -                                                                                 | -    | -      | -                                                                                 | -    | -      | -                                                                                   | -     | -      | -                                                                                   | -     |
| Veh in Median Storage, # | -      | 0                                                                                 | -    | -      | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Grade, %                 | -      | 0                                                                                 | -    | -      | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Peak Hour Factor         | 92     | 92                                                                                | 92   | 92     | 92                                                                                | 92   | 92     | 92                                                                                  | 92    | 92     | 92                                                                                  | 92    |
| Heavy Vehicles, %        | 2      | 2                                                                                 | 2    | 2      | 2                                                                                 | 2    | 2      | 2                                                                                   | 2     | 2      | 2                                                                                   | 2     |
| Mvmt Flow                | 5      | 22                                                                                | 11   | 5      | 11                                                                                | 5    | 0      | 5                                                                                   | 5     | 5      | 5                                                                                   | 16    |
|                          |        |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Major/Minor              | Major1 |                                                                                   |      | Major2 |                                                                                   |      | Minor1 |                                                                                     |       | Minor2 |                                                                                     |       |
| Conflicting Flow All     | 16     | 0                                                                                 | 0    | 33     | 0                                                                                 | 0    | 72     | 64                                                                                  | 28    | 67     | 67                                                                                  | 14    |
| Stage 1                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 38     | 38                                                                                  | -     | 24     | 24                                                                                  | -     |
| Stage 2                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 34     | 26                                                                                  | -     | 43     | 43                                                                                  | -     |
| Critical Hdwy            | 4.12   | -                                                                                 | -    | 4.12   | -                                                                                 | -    | 7.12   | 6.52                                                                                | 6.22  | 7.12   | 6.52                                                                                | 6.22  |
| Critical Hdwy Stg 1      | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Critical Hdwy Stg 2      | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Follow-up Hdwy           | 2.218  | -                                                                                 | -    | 2.218  | -                                                                                 | -    | 3.518  | 4.018                                                                               | 3.318 | 3.518  | 4.018                                                                               | 3.318 |
| Pot Cap-1 Maneuver       | 1602   | -                                                                                 | -    | 1579   | -                                                                                 | -    | 919    | 827                                                                                 | 1047  | 926    | 824                                                                                 | 1066  |
| Stage 1                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 977    | 863                                                                                 | -     | 994    | 875                                                                                 | -     |
| Stage 2                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 982    | 874                                                                                 | -     | 971    | 859                                                                                 | -     |
| Platoon blocked, %       |        | -                                                                                 | -    |        | -                                                                                 | -    |        |                                                                                     |       |        |                                                                                     |       |
| Mov Cap-1 Maneuver       | 1602   | -                                                                                 | -    | 1579   | -                                                                                 | -    | 896    | 822                                                                                 | 1047  | 912    | 819                                                                                 | 1066  |
| Mov Cap-2 Maneuver       | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 896    | 822                                                                                 | -     | 912    | 819                                                                                 | -     |
| Stage 1                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 974    | 860                                                                                 | -     | 991    | 872                                                                                 | -     |
| Stage 2                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 958    | 871                                                                                 | -     | 957    | 856                                                                                 | -     |
|                          |        |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Approach                 | EB     |                                                                                   |      | WB     |                                                                                   |      | NB     |                                                                                     |       | SB     |                                                                                     |       |
| HCM Control Delay, s     | 1      |                                                                                   |      | 1.8    |                                                                                   |      | 9      |                                                                                     |       | 8.8    |                                                                                     |       |
| HCM LOS                  |        |                                                                                   |      |        |                                                                                   |      | A      |                                                                                     |       | A      |                                                                                     |       |
|                          |        |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Minor Lane/Major Mvmt    | NBLn1  | EBL                                                                               | EBT  | EBR    | WBL                                                                               | WBT  | WBR    | SBLn1                                                                               |       |        |                                                                                     |       |
| Capacity (veh/h)         | 921    | 1602                                                                              | -    | -      | 1579                                                                              | -    | -      | 974                                                                                 |       |        |                                                                                     |       |
| HCM Lane V/C Ratio       | 0.012  | 0.003                                                                             | -    | -      | 0.003                                                                             | -    | -      | 0.028                                                                               |       |        |                                                                                     |       |
| HCM Control Delay (s)    | 9      | 7.3                                                                               | 0    | -      | 7.3                                                                               | 0    | -      | 8.8                                                                                 |       |        |                                                                                     |       |
| HCM Lane LOS             | A      | A                                                                                 | A    | -      | A                                                                                 | A    | -      | A                                                                                   |       |        |                                                                                     |       |
| HCM 95th %tile Q(veh)    | 0      | 0                                                                                 | -    | -      | 0                                                                                 | -    | -      | 0.1                                                                                 |       |        |                                                                                     |       |



---

## **APPENDIX C**

### LEVEL OF SERVICE CALCULATIONS

- Future Year 2022 Scenario 1 PM Peak
-

# HCM 2010 Signalized Intersection Summary

## 1: Napilihau Street

08/16/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 55                                                                                | 25                                                                                | 380                                                                               | 60                                                                                | 25                                                                                | 5                                                                                 | 385                                                                                 | 220                                                                                 | 65                                                                                  | 10                                                                                  | 285                                                                                 | 75                                                                                  |
| Future Volume (veh/h)        | 55                                                                                | 25                                                                                | 380                                                                               | 60                                                                                | 25                                                                                | 5                                                                                 | 385                                                                                 | 220                                                                                 | 65                                                                                  | 10                                                                                  | 285                                                                                 | 75                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 60                                                                                | 27                                                                                | 24                                                                                | 65                                                                                | 27                                                                                | 1                                                                                 | 418                                                                                 | 239                                                                                 | 45                                                                                  | 11                                                                                  | 310                                                                                 | 20                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 229                                                                               | 71                                                                                | 182                                                                               | 232                                                                               | 205                                                                               | 8                                                                                 | 505                                                                                 | 1023                                                                                | 870                                                                                 | 15                                                                                  | 509                                                                                 | 432                                                                                 |
| Arrive On Green              | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.28                                                                                | 0.55                                                                                | 0.55                                                                                | 0.01                                                                                | 0.27                                                                                | 0.27                                                                                |
| Sat Flow, veh/h              | 911                                                                               | 617                                                                               | 1583                                                                              | 1348                                                                              | 1785                                                                              | 66                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 87                                                                                | 0                                                                                 | 24                                                                                | 65                                                                                | 0                                                                                 | 28                                                                                | 418                                                                                 | 239                                                                                 | 45                                                                                  | 11                                                                                  | 310                                                                                 | 20                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1528                                                                              | 0                                                                                 | 1583                                                                              | 1348                                                                              | 0                                                                                 | 1851                                                                              | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 1.9                                                                               | 0.0                                                                               | 0.7                                                                               | 2.3                                                                               | 0.0                                                                               | 0.7                                                                               | 10.8                                                                                | 3.2                                                                                 | 0.6                                                                                 | 0.3                                                                                 | 7.1                                                                                 | 0.5                                                                                 |
| Cycle Q Clear(g_c), s        | 2.5                                                                               | 0.0                                                                               | 0.7                                                                               | 4.9                                                                               | 0.0                                                                               | 0.7                                                                               | 10.8                                                                                | 3.2                                                                                 | 0.6                                                                                 | 0.3                                                                                 | 7.1                                                                                 | 0.5                                                                                 |
| Prop In Lane                 | 0.69                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.04                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 300                                                                               | 0                                                                                 | 182                                                                               | 232                                                                               | 0                                                                                 | 213                                                                               | 505                                                                                 | 1023                                                                                | 870                                                                                 | 15                                                                                  | 509                                                                                 | 432                                                                                 |
| V/C Ratio(X)                 | 0.29                                                                              | 0.00                                                                              | 0.13                                                                              | 0.28                                                                              | 0.00                                                                              | 0.13                                                                              | 0.83                                                                                | 0.23                                                                                | 0.05                                                                                | 0.73                                                                                | 0.61                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h        | 863                                                                               | 0                                                                                 | 777                                                                               | 738                                                                               | 0                                                                                 | 908                                                                               | 1088                                                                                | 3008                                                                                | 2557                                                                                | 544                                                                                 | 2437                                                                                | 2071                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 20.2                                                                              | 0.0                                                                               | 19.5                                                                              | 22.6                                                                              | 0.0                                                                               | 19.5                                                                              | 16.4                                                                                | 5.7                                                                                 | 5.1                                                                                 | 24.2                                                                                | 15.5                                                                                | 13.1                                                                                |
| Incr Delay (d2), s/veh       | 0.5                                                                               | 0.0                                                                               | 0.3                                                                               | 0.7                                                                               | 0.0                                                                               | 0.3                                                                               | 3.5                                                                                 | 0.2                                                                                 | 0.1                                                                                 | 49.2                                                                                | 2.5                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.1                                                                               | 0.0                                                                               | 0.3                                                                               | 0.9                                                                               | 0.0                                                                               | 0.4                                                                               | 5.7                                                                                 | 1.7                                                                                 | 0.3                                                                                 | 0.4                                                                                 | 4.0                                                                                 | 0.2                                                                                 |
| LnGrp Delay(d),s/veh         | 20.8                                                                              | 0.0                                                                               | 19.8                                                                              | 23.2                                                                              | 0.0                                                                               | 19.7                                                                              | 19.9                                                                                | 5.9                                                                                 | 5.2                                                                                 | 73.4                                                                                | 18.0                                                                                | 13.2                                                                                |
| LnGrp LOS                    | C                                                                                 |                                                                                   | B                                                                                 | C                                                                                 |                                                                                   | B                                                                                 | B                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 111                                                                               |                                                                                   |                                                                                   | 93                                                                                |                                                                                   |                                                                                     | 702                                                                                 |                                                                                     |                                                                                     | 341                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 20.6                                                                              |                                                                                   |                                                                                   | 22.2                                                                              |                                                                                   |                                                                                     | 14.2                                                                                |                                                                                     |                                                                                     | 19.5                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.4                                                                               | 32.9                                                                              |                                                                                   | 10.6                                                                              | 18.9                                                                              | 19.4                                                                              |                                                                                     | 10.6                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 79.0                                                                              |                                                                                   | 24.0                                                                              | 30.0                                                                              | 64.0                                                                              |                                                                                     | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.3                                                                               | 5.2                                                                               |                                                                                   | 4.5                                                                               | 12.8                                                                              | 9.1                                                                               |                                                                                     | 6.9                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 3.5                                                                               |                                                                                   | 0.5                                                                               | 1.2                                                                               | 4.3                                                                               |                                                                                     | 0.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 16.8                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 2: Hoohui Road

08/16/2017

|                                | <div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div> |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                       | EBL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR  | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |      |  |  |  |  |  |  |
| Traffic Volume (veh/h)         | 75                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 20                                                                                | 155                                                                               | 45                                                                                | 15                                                                                | 10   | 200                                                                               | 595                                                                               | 45                                                                                | 25                                                                                 | 590                                                                                 | 80                                                                                  |
| Future Volume (veh/h)          | 75                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 20                                                                                | 155                                                                               | 45                                                                                | 15                                                                                | 10   | 200                                                                               | 595                                                                               | 45                                                                                | 25                                                                                 | 590                                                                                 | 80                                                                                  |
| Number                         | 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18   | 5                                                                                 | 2                                                                                 | 12                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh            | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)            | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00 | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj               | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln         | 1900                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h           | 82                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 22                                                                                | 14                                                                                | 49                                                                                | 16                                                                                | 1    | 217                                                                               | 647                                                                               | 0                                                                                 | 27                                                                                 | 641                                                                                 | 45                                                                                  |
| Adj No. of Lanes               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0    | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor               | 0.92                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %           | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                     | 271                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 55                                                                                | 207                                                                               | 238                                                                               | 226                                                                               | 14   | 441                                                                               | 978                                                                               | 831                                                                               | 392                                                                                | 819                                                                                 | 693                                                                                 |
| Arrive On Green                | 0.13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13 | 0.10                                                                              | 0.52                                                                              | 0.00                                                                              | 0.02                                                                               | 0.44                                                                                | 0.44                                                                                |
| Sat Flow, veh/h                | 1075                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 423                                                                               | 1583                                                                              | 1367                                                                              | 1735                                                                              | 108  | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                               | 1863                                                                                | 1576                                                                                |
| Grp Volume(v), veh/h           | 104                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0                                                                                 | 14                                                                                | 49                                                                                | 0                                                                                 | 17   | 217                                                                               | 647                                                                               | 0                                                                                 | 27                                                                                 | 641                                                                                 | 45                                                                                  |
| Grp Sat Flow(s),veh/h/ln       | 1498                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0                                                                                 | 1583                                                                              | 1367                                                                              | 0                                                                                 | 1844 | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                               | 1863                                                                                | 1576                                                                                |
| Q Serve(g_s), s                | 2.7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.0                                                                               | 0.4                                                                               | 1.7                                                                               | 0.0                                                                               | 0.4  | 3.0                                                                               | 12.4                                                                              | 0.0                                                                               | 0.4                                                                                | 14.4                                                                                | 0.8                                                                                 |
| Cycle Q Clear(g_c), s          | 3.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.0                                                                               | 0.4                                                                               | 4.8                                                                               | 0.0                                                                               | 0.4  | 3.0                                                                               | 12.4                                                                              | 0.0                                                                               | 0.4                                                                                | 14.4                                                                                | 0.8                                                                                 |
| Prop In Lane                   | 0.79                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.06 | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h         | 327                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0                                                                                 | 207                                                                               | 238                                                                               | 0                                                                                 | 241  | 441                                                                               | 978                                                                               | 831                                                                               | 392                                                                                | 819                                                                                 | 693                                                                                 |
| V/C Ratio(X)                   | 0.32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.00                                                                              | 0.07                                                                              | 0.21                                                                              | 0.00                                                                              | 0.07 | 0.49                                                                              | 0.66                                                                              | 0.00                                                                              | 0.07                                                                               | 0.78                                                                                | 0.06                                                                                |
| Avail Cap(c_a), veh/h          | 883                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0                                                                                 | 806                                                                               | 756                                                                               | 0                                                                                 | 939  | 798                                                                               | 1935                                                                              | 1645                                                                              | 901                                                                                | 1935                                                                                | 1637                                                                                |
| HCM Platoon Ratio              | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)             | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh       | 19.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.0                                                                               | 18.7                                                                              | 22.2                                                                              | 0.0                                                                               | 18.7 | 8.7                                                                               | 8.5                                                                               | 0.0                                                                               | 8.0                                                                                | 11.7                                                                                | 7.9                                                                                 |
| Incr Delay (d2), s/veh         | 0.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.0                                                                               | 0.1                                                                               | 0.4                                                                               | 0.0                                                                               | 0.1  | 0.9                                                                               | 0.8                                                                               | 0.0                                                                               | 0.1                                                                                | 1.7                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh      | 0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln       | 1.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.0                                                                               | 0.2                                                                               | 0.7                                                                               | 0.0                                                                               | 0.2  | 1.5                                                                               | 6.5                                                                               | 0.0                                                                               | 0.2                                                                                | 7.7                                                                                 | 0.4                                                                                 |
| LnGrp Delay(d),s/veh           | 20.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.0                                                                               | 18.9                                                                              | 22.6                                                                              | 0.0                                                                               | 18.9 | 9.6                                                                               | 9.3                                                                               | 0.0                                                                               | 8.1                                                                                | 13.4                                                                                | 8.0                                                                                 |
| LnGrp LOS                      | C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                   | B                                                                                 | C                                                                                 |                                                                                   | B    | A                                                                                 | A                                                                                 |                                                                                   | A                                                                                  | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h            | 118                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 66   |                                                                                   | 864                                                                               |                                                                                   | 713                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh          | 20.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 21.6 |                                                                                   | 9.3                                                                               |                                                                                   | 12.9                                                                               |                                                                                     |                                                                                     |
| Approach LOS                   | C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   | C    |                                                                                   | A                                                                                 |                                                                                   | B                                                                                  |                                                                                     |                                                                                     |
| Timer                          | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6    | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| Assigned Phs                   | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2                                                                                 |                                                                                   |                                                                                   | 4                                                                                 | 5    | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s       | 5.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 31.8                                                                              |                                                                                   |                                                                                   | 11.4                                                                              | 10.1 | 27.6                                                                              | 11.4                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s        | 5.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 6.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 5.0  | 6.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s    | 15.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 51.0                                                                              |                                                                                   |                                                                                   | 25.0                                                                              | 15.0 | 51.0                                                                              | 25.0                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+12.5), s | 12.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 14.4                                                                              |                                                                                   |                                                                                   | 5.1                                                                               | 5.0  | 16.4                                                                              | 6.8                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s        | 0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 4.9                                                                               |                                                                                   |                                                                                   | 0.5                                                                               | 0.4  | 4.9                                                                               | 0.1                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| Intersection Summary           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                   | 12.0                                                                              |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| HCM 2010 LOS                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 3: Honoapiilani Highway & Akahele Street

08/16/2017

|                               |  |  |  |  |  |  |  |  |  |   |  |  |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)        | 60                                                                                | 15                                                                                | 95                                                                                | 30                                                                                | 15                                                                                | 25                                                                                | 165                                                                               | 815                                                                               | 55                                                                                | 25                                                                                  | 765                                                                                 | 75                                                                                  |
| Future Volume (veh/h)         | 60                                                                                | 15                                                                                | 95                                                                                | 30                                                                                | 15                                                                                | 25                                                                                | 165                                                                               | 815                                                                               | 55                                                                                | 25                                                                                  | 765                                                                                 | 75                                                                                  |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                 | 2                                                                                 | 12                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 65                                                                                | 16                                                                                | 3                                                                                 | 33                                                                                | 16                                                                                | 1                                                                                 | 179                                                                               | 886                                                                               | 37                                                                                | 27                                                                                  | 832                                                                                 | 42                                                                                  |
| Adj No. of Lanes              | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 85                                                                                | 185                                                                               | 35                                                                                | 45                                                                                | 184                                                                               | 154                                                                               | 220                                                                               | 1132                                                                              | 963                                                                               | 33                                                                                  | 936                                                                                 | 794                                                                                 |
| Arrive On Green               | 0.05                                                                              | 0.12                                                                              | 0.12                                                                              | 0.03                                                                              | 0.10                                                                              | 0.10                                                                              | 0.12                                                                              | 0.61                                                                              | 0.61                                                                              | 0.02                                                                                | 0.50                                                                                | 0.50                                                                                |
| Sat Flow, veh/h               | 1774                                                                              | 1518                                                                              | 285                                                                               | 1774                                                                              | 1863                                                                              | 1554                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1580                                                                                |
| Grp Volume(v), veh/h          | 65                                                                                | 0                                                                                 | 19                                                                                | 33                                                                                | 16                                                                                | 1                                                                                 | 179                                                                               | 886                                                                               | 37                                                                                | 27                                                                                  | 832                                                                                 | 42                                                                                  |
| Grp Sat Flow(s),veh/h/ln      | 1774                                                                              | 0                                                                                 | 1803                                                                              | 1774                                                                              | 1863                                                                              | 1554                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1580                                                                                |
| Q Serve(g_s), s               | 3.2                                                                               | 0.0                                                                               | 0.8                                                                               | 1.6                                                                               | 0.7                                                                               | 0.1                                                                               | 8.7                                                                               | 31.4                                                                              | 0.8                                                                               | 1.3                                                                                 | 35.4                                                                                | 1.2                                                                                 |
| Cycle Q Clear(g_c), s         | 3.2                                                                               | 0.0                                                                               | 0.8                                                                               | 1.6                                                                               | 0.7                                                                               | 0.1                                                                               | 8.7                                                                               | 31.4                                                                              | 0.8                                                                               | 1.3                                                                                 | 35.4                                                                                | 1.2                                                                                 |
| Prop In Lane                  | 1.00                                                                              |                                                                                   | 0.16                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 85                                                                                | 0                                                                                 | 219                                                                               | 45                                                                                | 184                                                                               | 154                                                                               | 220                                                                               | 1132                                                                              | 963                                                                               | 33                                                                                  | 936                                                                                 | 794                                                                                 |
| V/C Ratio(X)                  | 0.77                                                                              | 0.00                                                                              | 0.09                                                                              | 0.74                                                                              | 0.09                                                                              | 0.01                                                                              | 0.81                                                                              | 0.78                                                                              | 0.04                                                                              | 0.82                                                                                | 0.89                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h         | 402                                                                               | 0                                                                                 | 429                                                                               | 402                                                                               | 443                                                                               | 370                                                                               | 503                                                                               | 1372                                                                              | 1167                                                                              | 503                                                                                 | 1372                                                                                | 1164                                                                                |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 41.5                                                                              | 0.0                                                                               | 34.4                                                                              | 42.7                                                                              | 36.1                                                                              | 35.8                                                                              | 37.7                                                                              | 12.9                                                                              | 6.9                                                                               | 43.1                                                                                | 19.7                                                                                | 11.2                                                                                |
| Incr Delay (d2), s/veh        | 13.3                                                                              | 0.0                                                                               | 0.2                                                                               | 21.0                                                                              | 0.2                                                                               | 0.0                                                                               | 7.2                                                                               | 2.5                                                                               | 0.0                                                                               | 37.4                                                                                | 5.3                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 1.9                                                                               | 0.0                                                                               | 0.4                                                                               | 1.1                                                                               | 0.4                                                                               | 0.0                                                                               | 4.7                                                                               | 16.8                                                                              | 0.4                                                                               | 1.0                                                                                 | 19.4                                                                                | 0.5                                                                                 |
| LnGrp Delay(d),s/veh          | 54.8                                                                              | 0.0                                                                               | 34.6                                                                              | 63.7                                                                              | 36.3                                                                              | 35.8                                                                              | 44.8                                                                              | 15.4                                                                              | 7.0                                                                               | 80.5                                                                                | 25.0                                                                                | 11.2                                                                                |
| LnGrp LOS                     | D                                                                                 |                                                                                   | C                                                                                 | E                                                                                 | D                                                                                 | D                                                                                 | D                                                                                 | B                                                                                 | A                                                                                 | F                                                                                   | C                                                                                   | B                                                                                   |
| Approach Vol, veh/h           | 84                                                                                |                                                                                   |                                                                                   |                                                                                   | 50                                                                                |                                                                                   | 1102                                                                              |                                                                                   |                                                                                   |                                                                                     | 901                                                                                 |                                                                                     |
| Approach Delay, s/veh         | 50.3                                                                              |                                                                                   |                                                                                   |                                                                                   | 54.4                                                                              |                                                                                   | 19.9                                                                              |                                                                                   |                                                                                   |                                                                                     | 26.1                                                                                |                                                                                     |
| Approach LOS                  | D                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                     | C                                                                                   |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 6.6                                                                               | 58.6                                                                              | 7.2                                                                               | 15.7                                                                              | 15.9                                                                              | 49.3                                                                              | 9.2                                                                               | 13.7                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.3), s | 13.3                                                                              | 33.4                                                                              | 3.6                                                                               | 2.8                                                                               | 10.7                                                                              | 37.4                                                                              | 5.2                                                                               | 2.7                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.0                                                                               | 7.9                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 6.9                                                                               | 0.1                                                                               | 0.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           |                                                                                   |                                                                                   | 24.5                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 4: Honoapiilani Highway & Lower Honoapiilani Road

08/16/2017

|                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-----------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                             |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                    | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations         |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)      | 80                                                                                | 5                                                                                 | 600                                                                               | 80                                                                                | 10                                                                                | 10                                                                                | 605                                                                               | 920                                                                               | 10                                                                                | 5                                                                                   | 830                                                                                 | 20                                                                                  |
| Future Volume (veh/h)       | 80                                                                                | 5                                                                                 | 600                                                                               | 80                                                                                | 10                                                                                | 10                                                                                | 605                                                                               | 920                                                                               | 10                                                                                | 5                                                                                   | 830                                                                                 | 20                                                                                  |
| Number                      | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh         | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)         | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln      | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h        | 87                                                                                | 5                                                                                 | 0                                                                                 | 87                                                                                | 11                                                                                | 9                                                                                 | 658                                                                               | 1000                                                                              | 11                                                                                | 5                                                                                   | 902                                                                                 | 5                                                                                   |
| Adj No. of Lanes            | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor            | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %        | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                  | 203                                                                               | 7                                                                                 | 139                                                                               | 186                                                                               | 15                                                                                | 12                                                                                | 702                                                                               | 2685                                                                              | 30                                                                                | 7                                                                                   | 1263                                                                                | 565                                                                                 |
| Arrive On Green             | 0.10                                                                              | 0.09                                                                              | 0.00                                                                              | 0.10                                                                              | 0.09                                                                              | 0.09                                                                              | 0.40                                                                              | 0.75                                                                              | 0.75                                                                              | 0.00                                                                                | 0.36                                                                                | 0.36                                                                                |
| Sat Flow, veh/h             | 1466                                                                              | 84                                                                                | 1583                                                                              | 1329                                                                              | 168                                                                               | 137                                                                               | 1774                                                                              | 3586                                                                              | 39                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h        | 92                                                                                | 0                                                                                 | 0                                                                                 | 107                                                                               | 0                                                                                 | 0                                                                                 | 658                                                                               | 493                                                                               | 518                                                                               | 5                                                                                   | 902                                                                                 | 5                                                                                   |
| Grp Sat Flow(s),veh/h/ln    | 1550                                                                              | 0                                                                                 | 1583                                                                              | 1634                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                              | 1770                                                                              | 1856                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s             | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.5                                                                               | 0.0                                                                               | 0.0                                                                               | 33.4                                                                              | 9.1                                                                               | 9.1                                                                               | 0.3                                                                                 | 20.6                                                                                | 0.2                                                                                 |
| Cycle Q Clear(g_c), s       | 5.0                                                                               | 0.0                                                                               | 0.0                                                                               | 5.5                                                                               | 0.0                                                                               | 0.0                                                                               | 33.4                                                                              | 9.1                                                                               | 9.1                                                                               | 0.3                                                                                 | 20.6                                                                                | 0.2                                                                                 |
| Prop In Lane                | 0.95                                                                              |                                                                                   | 1.00                                                                              | 0.81                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                              |                                                                                   | 0.02                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h      | 227                                                                               | 0                                                                                 | 139                                                                               | 230                                                                               | 0                                                                                 | 0                                                                                 | 702                                                                               | 1325                                                                              | 1389                                                                              | 7                                                                                   | 1263                                                                                | 565                                                                                 |
| V/C Ratio(X)                | 0.41                                                                              | 0.00                                                                              | 0.00                                                                              | 0.47                                                                              | 0.00                                                                              | 0.00                                                                              | 0.94                                                                              | 0.37                                                                              | 0.37                                                                              | 0.72                                                                                | 0.71                                                                                | 0.01                                                                                |
| Avail Cap(c_a), veh/h       | 553                                                                               | 0                                                                                 | 506                                                                               | 521                                                                               | 0                                                                                 | 0                                                                                 | 1342                                                                              | 1325                                                                              | 1389                                                                              | 1342                                                                                | 2150                                                                                | 962                                                                                 |
| HCM Platoon Ratio           | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)          | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh    | 40.9                                                                              | 0.0                                                                               | 0.0                                                                               | 41.1                                                                              | 0.0                                                                               | 0.0                                                                               | 27.2                                                                              | 4.1                                                                               | 4.1                                                                               | 46.7                                                                                | 26.0                                                                                | 19.5                                                                                |
| Incr Delay (d2), s/veh      | 1.2                                                                               | 0.0                                                                               | 0.0                                                                               | 1.5                                                                               | 0.0                                                                               | 0.0                                                                               | 2.8                                                                               | 0.4                                                                               | 0.4                                                                               | 40.7                                                                                | 1.6                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh   | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln    | 2.3                                                                               | 0.0                                                                               | 0.0                                                                               | 2.7                                                                               | 0.0                                                                               | 0.0                                                                               | 16.8                                                                              | 4.5                                                                               | 4.7                                                                               | 0.2                                                                                 | 10.3                                                                                | 0.1                                                                                 |
| LnGrp Delay(d),s/veh        | 42.1                                                                              | 0.0                                                                               | 0.0                                                                               | 42.6                                                                              | 0.0                                                                               | 0.0                                                                               | 30.0                                                                              | 4.5                                                                               | 4.5                                                                               | 87.4                                                                                | 27.7                                                                                | 19.5                                                                                |
| LnGrp LOS                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | C                                                                                 | A                                                                                 | A                                                                                 | F                                                                                   | C                                                                                   | B                                                                                   |
| Approach Vol, veh/h         | 92                                                                                |                                                                                   |                                                                                   |                                                                                   | 107                                                                               |                                                                                   |                                                                                   |                                                                                   | 1669                                                                              |                                                                                     | 912                                                                                 |                                                                                     |
| Approach Delay, s/veh       | 42.1                                                                              |                                                                                   |                                                                                   |                                                                                   | 42.6                                                                              |                                                                                   |                                                                                   |                                                                                   | 14.5                                                                              |                                                                                     | 27.9                                                                                |                                                                                     |
| Approach LOS                | D                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                     | C                                                                                   |                                                                                     |
| Timer                       | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s    | 41.1                                                                              | 39.5                                                                              |                                                                                   | 13.2                                                                              | 4.4                                                                               | 76.2                                                                              |                                                                                   | 13.2                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s     | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s | 71.0                                                                              | 57.0                                                                              |                                                                                   | 27.0                                                                              | 71.0                                                                              | 57.0                                                                              |                                                                                   | 30.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+Q), s | 25.4                                                                              | 22.6                                                                              |                                                                                   | 7.5                                                                               | 2.3                                                                               | 11.1                                                                              |                                                                                   | 7.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s     | 1.7                                                                               | 10.8                                                                              |                                                                                   | 0.3                                                                               | 0.0                                                                               | 12.5                                                                              |                                                                                   | 0.3                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay         |                                                                                   |                                                                                   | 20.9                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 5: Honoapiilani Highway & Halawai Drive

08/16/2017

| Movement                       | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|--------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations            |      | ↰    | ↱    |      | ↰    |      | ↱    | ↰    |      | ↱    | ↰    | ↱    |
| Traffic Volume (veh/h)         | 50   | 5    | 140  | 15   | 0    | 5    | 135  | 1475 | 10   | 10   | 1505 | 60   |
| Future Volume (veh/h)          | 50   | 5    | 140  | 15   | 0    | 5    | 135  | 1475 | 10   | 10   | 1505 | 60   |
| Number                         | 3    | 8    | 18   | 7    | 4    | 14   | 1    | 6    | 16   | 5    | 2    | 12   |
| Initial Q (Qb), veh            | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)            | 0.97 |      | 0.96 | 0.97 |      | 0.96 | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Parking Bus, Adj               | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln         | 1900 | 1863 | 1863 | 1900 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h           | 54   | 5    | 6    | 16   | 0    | 1    | 147  | 1603 | 11   | 11   | 1636 | 39   |
| Adj No. of Lanes               | 0    | 1    | 1    | 0    | 1    | 0    | 1    | 2    | 0    | 1    | 2    | 1    |
| Peak Hour Factor               | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, %           | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |
| Cap, veh/h                     | 228  | 18   | 173  | 185  | 2    | 7    | 180  | 2622 | 18   | 14   | 2246 | 1004 |
| Arrive On Green                | 0.12 | 0.11 | 0.11 | 0.12 | 0.00 | 0.11 | 0.10 | 0.73 | 0.73 | 0.01 | 0.63 | 0.63 |
| Sat Flow, veh/h                | 1354 | 155  | 1521 | 966  | 19   | 62   | 1774 | 3603 | 25   | 1774 | 3539 | 1582 |
| Grp Volume(v), veh/h           | 59   | 0    | 6    | 17   | 0    | 0    | 147  | 787  | 827  | 11   | 1636 | 39   |
| Grp Sat Flow(s),veh/h/ln       | 1509 | 0    | 1521 | 1047 | 0    | 0    | 1774 | 1770 | 1858 | 1774 | 1770 | 1582 |
| Q Serve(g_s), s                | 0.0  | 0.0  | 0.3  | 0.9  | 0.0  | 0.0  | 7.6  | 20.3 | 20.3 | 0.6  | 29.3 | 0.9  |
| Cycle Q Clear(g_c), s          | 2.9  | 0.0  | 0.3  | 3.8  | 0.0  | 0.0  | 7.6  | 20.3 | 20.3 | 0.6  | 29.3 | 0.9  |
| Prop In Lane                   | 0.92 |      | 1.00 | 0.94 |      | 0.06 | 1.00 |      | 0.01 | 1.00 |      | 1.00 |
| Lane Grp Cap(c), veh/h         | 262  | 0    | 173  | 205  | 0    | 0    | 180  | 1288 | 1352 | 14   | 2246 | 1004 |
| V/C Ratio(X)                   | 0.23 | 0.00 | 0.03 | 0.08 | 0.00 | 0.00 | 0.82 | 0.61 | 0.61 | 0.78 | 0.73 | 0.04 |
| Avail Cap(c_a), veh/h          | 448  | 0    | 376  | 387  | 0    | 0    | 400  | 1634 | 1716 | 209  | 2888 | 1291 |
| HCM Platoon Ratio              | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I)             | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh       | 37.4 | 0.0  | 36.7 | 38.6 | 0.0  | 0.0  | 41.0 | 6.2  | 6.2  | 46.1 | 11.6 | 6.4  |
| Incr Delay (d2), s/veh         | 0.2  | 0.0  | 0.0  | 0.1  | 0.0  | 0.0  | 3.5  | 1.0  | 1.0  | 27.8 | 1.1  | 0.0  |
| Initial Q Delay(d3),s/veh      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln       | 1.4  | 0.0  | 0.1  | 0.4  | 0.0  | 0.0  | 3.9  | 10.0 | 10.5 | 0.4  | 14.4 | 0.4  |
| LnGrp Delay(d),s/veh           | 37.6 | 0.0  | 36.7 | 38.7 | 0.0  | 0.0  | 44.5 | 7.2  | 7.2  | 73.9 | 12.7 | 6.4  |
| LnGrp LOS                      | D    |      | D    | D    |      |      | D    | A    | A    | E    | B    | A    |
| Approach Vol, veh/h            | 65   |      |      |      |      | 17   |      | 1761 |      | 1686 |      |      |
| Approach Delay, s/veh          | 37.5 |      |      |      |      | 38.7 |      | 10.3 |      | 13.0 |      |      |
| Approach LOS                   | D    |      |      |      |      | D    |      | B    |      | B    |      |      |
| Timer                          | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    |      |      |      |      |
| Assigned Phs                   | 1    | 2    | 4    |      | 5    | 6    | 8    |      |      |      |      |      |
| Phs Duration (G+Y+Rc), s       | 13.4 | 64.1 | 15.6 |      | 4.7  | 72.8 | 15.6 |      |      |      |      |      |
| Change Period (Y+Rc), s        | 4.0  | 5.0  | 5.0  |      | 4.0  | 5.0  | 5.0  |      |      |      |      |      |
| Max Green Setting (Gmax), s    | 21.0 | 76.0 | 23.0 |      | 11.0 | 86.0 | 23.0 |      |      |      |      |      |
| Max Q Clear Time (g_c+19.6), s | 19.6 | 31.3 | 5.8  |      | 2.6  | 22.3 | 4.9  |      |      |      |      |      |
| Green Ext Time (p_c), s        | 0.1  | 27.8 | 0.0  |      | 0.0  | 31.2 | 0.1  |      |      |      |      |      |
| Intersection Summary           |      |      |      |      |      |      |      |      |      |      |      |      |
| HCM 2010 Ctrl Delay            |      |      | 12.2 |      |      |      |      |      |      |      |      |      |
| HCM 2010 LOS                   |      |      | B    |      |      |      |      |      |      |      |      |      |

# HCM 2010 Signalized Intersection Summary

## 6: Honoapiilani Highway & Kai Ala Drive/Puukolii Road

08/16/2017

|                              | <div></div> |                                                                                   |                                                                                   |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR   | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |       |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 75                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 5                                                                                 | 175                                                                               | 70                                                                                | 5                                                                                 | 45    | 125                                                                               | 1460                                                                              | 60                                                                                | 35                                                                                  | 1660                                                                                | 100                                                                                 |
| Future Volume (veh/h)        | 75                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 5                                                                                 | 175                                                                               | 70                                                                                | 5                                                                                 | 45    | 125                                                                               | 1460                                                                              | 60                                                                                | 35                                                                                  | 1660                                                                                | 100                                                                                 |
| Number                       | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14    | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0     | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                   | 0.99                                                                              | 0.99                                                                              |                                                                                   | 0.99  | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00  | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900  | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 82                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 5                                                                                 | 27                                                                                | 76                                                                                | 5                                                                                 | 1     | 136                                                                               | 1587                                                                              | 49                                                                                | 38                                                                                  | 1804                                                                                | 85                                                                                  |
| Adj No. of Lanes             | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0     | 1                                                                                 | 2                                                                                 | 1                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92  | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2     | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 212                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 12                                                                                | 205                                                                               | 142                                                                               | 197                                                                               | 39    | 157                                                                               | 2656                                                                              | 1187                                                                              | 49                                                                                  | 2440                                                                                | 1091                                                                                |
| Arrive On Green              | 0.14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13  | 0.09                                                                              | 0.75                                                                              | 0.75                                                                              | 0.03                                                                                | 0.69                                                                                | 0.69                                                                                |
| Sat Flow, veh/h              | 1298                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 89                                                                                | 1562                                                                              | 1358                                                                              | 1504                                                                              | 301   | 1774                                                                              | 3539                                                                              | 1582                                                                              | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 87                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0                                                                                 | 27                                                                                | 76                                                                                | 0                                                                                 | 6     | 136                                                                               | 1587                                                                              | 49                                                                                | 38                                                                                  | 1804                                                                                | 85                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1387                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0                                                                                 | 1562                                                                              | 1358                                                                              | 0                                                                                 | 1805  | 1774                                                                              | 1770                                                                              | 1582                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 9.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.0                                                                               | 2.5                                                                               | 9.1                                                                               | 0.0                                                                               | 0.5   | 12.5                                                                              | 33.5                                                                              | 1.3                                                                               | 3.5                                                                                 | 53.3                                                                                | 2.9                                                                                 |
| Cycle Q Clear(g_c), s        | 9.7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.0                                                                               | 2.5                                                                               | 18.8                                                                              | 0.0                                                                               | 0.5   | 12.5                                                                              | 33.5                                                                              | 1.3                                                                               | 3.5                                                                                 | 53.3                                                                                | 2.9                                                                                 |
| Prop In Lane                 | 0.94                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.17  | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 233                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0                                                                                 | 205                                                                               | 142                                                                               | 0                                                                                 | 237   | 157                                                                               | 2656                                                                              | 1187                                                                              | 49                                                                                  | 2440                                                                                | 1091                                                                                |
| V/C Ratio(X)                 | 0.37                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.00                                                                              | 0.13                                                                              | 0.54                                                                              | 0.00                                                                              | 0.03  | 0.86                                                                              | 0.60                                                                              | 0.04                                                                              | 0.78                                                                                | 0.74                                                                                | 0.08                                                                                |
| Avail Cap(c_a), veh/h        | 253                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0                                                                                 | 227                                                                               | 161                                                                               | 0                                                                                 | 263   | 280                                                                               | 2656                                                                              | 1187                                                                              | 108                                                                                 | 2440                                                                                | 1091                                                                                |
| HCM Platoon Ratio            | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00  | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00  | 0.70                                                                              | 0.70                                                                              | 0.70                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 66.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.0                                                                               | 63.4                                                                              | 75.2                                                                              | 0.0                                                                               | 62.5  | 74.2                                                                              | 9.3                                                                               | 5.3                                                                               | 79.7                                                                                | 16.2                                                                                | 8.4                                                                                 |
| Incr Delay (d2), s/veh       | 1.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.0                                                                               | 0.3                                                                               | 3.1                                                                               | 0.0                                                                               | 0.0   | 3.8                                                                               | 0.7                                                                               | 0.0                                                                               | 9.3                                                                                 | 2.1                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0   | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 8.7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.0                                                                               | 1.1                                                                               | 3.5                                                                               | 0.0                                                                               | 0.2   | 6.3                                                                               | 16.3                                                                              | 0.6                                                                               | 1.8                                                                                 | 26.5                                                                                | 1.3                                                                                 |
| LnGrp Delay(d),s/veh         | 67.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.0                                                                               | 63.7                                                                              | 78.4                                                                              | 0.0                                                                               | 62.5  | 78.0                                                                              | 10.0                                                                              | 5.3                                                                               | 89.0                                                                                | 18.3                                                                                | 8.6                                                                                 |
| LnGrp LOS                    | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                   | E                                                                                 | E                                                                                 |                                                                                   | E     | E                                                                                 | B                                                                                 | A                                                                                 | F                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 114                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 82    |                                                                                   | 1772                                                                              |                                                                                   | 1927                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 66.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 77.2  |                                                                                   | 15.1                                                                              |                                                                                   | 19.3                                                                                |                                                                                     |                                                                                     |
| Approach LOS                 | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   | E     |                                                                                   | B                                                                                 |                                                                                   | B                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6     | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2                                                                                 | 4                                                                                 |                                                                                   | 5                                                                                 | 6     | 8                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 18.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 119.7                                                                             | 26.6                                                                              |                                                                                   | 8.6                                                                               | 129.8 | 26.6                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 6.0                                                                               | 5.0                                                                               |                                                                                   | 4.0                                                                               | 6.0   | 5.0                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 20.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 100.0                                                                             | 24.0                                                                              |                                                                                   | 10.0                                                                              | 116.0 | 24.0                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+14), s | 14.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 55.3                                                                              | 20.8                                                                              |                                                                                   | 5.5                                                                               | 35.5  | 11.7                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 31.9                                                                              | 0.1                                                                               |                                                                                   | 0.0                                                                               | 35.9  | 0.3                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                   | 20.0                                                                              |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 7: Honoapiilani Highway & Kaanapali Parkway/Halelo Street

08/16/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)        | 295                                                                               | 5                                                                                 | 615                                                                               | 15                                                                                | 0                                                                                 | 5                                                                                 | 385                                                                               | 1500                                                                              | 10                                                                                | 75                                                                                  | 1705                                                                                | 135                                                                                 |
| Future Volume (veh/h)         | 295                                                                               | 5                                                                                 | 615                                                                               | 15                                                                                | 0                                                                                 | 5                                                                                 | 385                                                                               | 1500                                                                              | 10                                                                                | 75                                                                                  | 1705                                                                                | 135                                                                                 |
| Number                        | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 0.96                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 325                                                                               | 0                                                                                 | 460                                                                               | 16                                                                                | 0                                                                                 | 1                                                                                 | 418                                                                               | 1630                                                                              | 11                                                                                | 82                                                                                  | 1853                                                                                | 126                                                                                 |
| Adj No. of Lanes              | 2                                                                                 | 0                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 2                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 531                                                                               | 0                                                                                 | 903                                                                               | 69                                                                                | 0                                                                                 | 4                                                                                 | 490                                                                               | 2419                                                                              | 16                                                                                | 113                                                                                 | 2098                                                                                | 1168                                                                                |
| Arrive On Green               | 0.15                                                                              | 0.00                                                                              | 0.14                                                                              | 0.04                                                                              | 0.00                                                                              | 0.03                                                                              | 0.14                                                                              | 0.67                                                                              | 0.66                                                                              | 0.06                                                                                | 0.59                                                                                | 0.59                                                                                |
| Sat Flow, veh/h               | 3548                                                                              | 0                                                                                 | 3123                                                                              | 1653                                                                              | 0                                                                                 | 103                                                                               | 3442                                                                              | 3604                                                                              | 24                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h          | 325                                                                               | 0                                                                                 | 460                                                                               | 17                                                                                | 0                                                                                 | 0                                                                                 | 418                                                                               | 800                                                                               | 841                                                                               | 82                                                                                  | 1853                                                                                | 126                                                                                 |
| Grp Sat Flow(s),veh/h/ln      | 1774                                                                              | 0                                                                                 | 1561                                                                              | 1756                                                                              | 0                                                                                 | 0                                                                                 | 1721                                                                              | 1770                                                                              | 1858                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s               | 18.6                                                                              | 0.0                                                                               | 26.8                                                                              | 2.0                                                                               | 0.0                                                                               | 0.0                                                                               | 25.8                                                                              | 58.9                                                                              | 59.1                                                                              | 9.9                                                                                 | 97.2                                                                                | 4.9                                                                                 |
| Cycle Q Clear(g_c), s         | 18.6                                                                              | 0.0                                                                               | 26.8                                                                              | 2.0                                                                               | 0.0                                                                               | 0.0                                                                               | 25.8                                                                              | 58.9                                                                              | 59.1                                                                              | 9.9                                                                                 | 97.2                                                                                | 4.9                                                                                 |
| Prop In Lane                  | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.94                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                              |                                                                                   | 0.01                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 531                                                                               | 0                                                                                 | 903                                                                               | 73                                                                                | 0                                                                                 | 0                                                                                 | 490                                                                               | 1188                                                                              | 1247                                                                              | 113                                                                                 | 2098                                                                                | 1168                                                                                |
| V/C Ratio(X)                  | 0.61                                                                              | 0.00                                                                              | 0.51                                                                              | 0.23                                                                              | 0.00                                                                              | 0.00                                                                              | 0.85                                                                              | 0.67                                                                              | 0.67                                                                              | 0.72                                                                                | 0.88                                                                                | 0.11                                                                                |
| Avail Cap(c_a), veh/h         | 555                                                                               | 0                                                                                 | 925                                                                               | 251                                                                               | 0                                                                                 | 0                                                                                 | 919                                                                               | 1580                                                                              | 1659                                                                              | 122                                                                                 | 2460                                                                                | 1330                                                                                |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 86.5                                                                              | 0.0                                                                               | 64.7                                                                              | 100.8                                                                             | 0.0                                                                               | 0.0                                                                               | 91.0                                                                              | 21.4                                                                              | 21.5                                                                              | 99.8                                                                                | 37.8                                                                                | 8.1                                                                                 |
| Incr Delay (d2), s/veh        | 1.3                                                                               | 0.0                                                                               | 0.2                                                                               | 0.6                                                                               | 0.0                                                                               | 0.0                                                                               | 1.7                                                                               | 1.0                                                                               | 0.9                                                                               | 14.6                                                                                | 4.0                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 9.3                                                                               | 0.0                                                                               | 11.6                                                                              | 1.0                                                                               | 0.0                                                                               | 0.0                                                                               | 12.4                                                                              | 29.0                                                                              | 30.5                                                                              | 5.3                                                                                 | 48.5                                                                                | 3.4                                                                                 |
| LnGrp Delay(d),s/veh          | 87.8                                                                              | 0.0                                                                               | 64.9                                                                              | 101.4                                                                             | 0.0                                                                               | 0.0                                                                               | 92.7                                                                              | 22.4                                                                              | 22.4                                                                              | 114.5                                                                               | 41.8                                                                                | 8.2                                                                                 |
| LnGrp LOS                     | F                                                                                 |                                                                                   | E                                                                                 | F                                                                                 |                                                                                   |                                                                                   | F                                                                                 | C                                                                                 | C                                                                                 | F                                                                                   | D                                                                                   | A                                                                                   |
| Approach Vol, veh/h           | 785                                                                               |                                                                                   |                                                                                   | 17                                                                                |                                                                                   |                                                                                   | 2059                                                                              |                                                                                   |                                                                                   | 2061                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 74.4                                                                              |                                                                                   |                                                                                   | 101.4                                                                             |                                                                                   |                                                                                   | 36.7                                                                              |                                                                                   |                                                                                   | 42.6                                                                                |                                                                                     |                                                                                     |
| Approach LOS                  | E                                                                                 |                                                                                   |                                                                                   | F                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                   |                                                                                     |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 34.9                                                                              | 132.8                                                                             |                                                                                   | 13.1                                                                              | 17.9                                                                              | 149.8                                                                             |                                                                                   | 36.5                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 6.0                                                                               | 6.0                                                                               |                                                                                   | 7.0                                                                               | 6.0                                                                               | 6.0                                                                               |                                                                                   | 7.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 50.0                                                                              | 149.0                                                                             |                                                                                   | 28.0                                                                              | 13.0                                                                              | 192.0                                                                             |                                                                                   | 31.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+2.0), s | 27.8                                                                              | 99.2                                                                              |                                                                                   | 4.0                                                                               | 11.9                                                                              | 61.1                                                                              |                                                                                   | 28.8                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 1.1                                                                               | 27.6                                                                              |                                                                                   | 0.0                                                                               | 0.0                                                                               | 22.6                                                                              |                                                                                   | 0.7                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           | 45.4                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  | D                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 8: Honoapiilani Highway & Leialii Parkway

08/16/2017

|                               |  |       |      |      |      |       |      |      |      |      |      |      |
|-------------------------------|------------------------------------------------------------------------------------|-------|------|------|------|-------|------|------|------|------|------|------|
| Movement                      | EBL                                                                                | EBT   | EBR  | WBL  | WBT  | WBR   | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations           |                                                                                    | ↕     |      | ↕    | ↕    |       | ↕    | ↕    |      | ↕    | ↕    |      |
| Traffic Volume (veh/h)        | 10                                                                                 | 0     | 5    | 90   | 5    | 60    | 10   | 1835 | 90   | 85   | 2265 | 5    |
| Future Volume (veh/h)         | 10                                                                                 | 0     | 5    | 90   | 5    | 60    | 10   | 1835 | 90   | 85   | 2265 | 5    |
| Number                        | 3                                                                                  | 8     | 18   | 7    | 4    | 14    | 1    | 6    | 16   | 5    | 2    | 12   |
| Initial Q (Qb), veh           | 0                                                                                  | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                               |       | 1.00 | 1.00 |      | 1.00  | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Parking Bus, Adj              | 1.00                                                                               | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln        | 1900                                                                               | 1863  | 1900 | 1863 | 1863 | 1900  | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h          | 11                                                                                 | 0     | 1    | 98   | 5    | 2     | 11   | 1995 | 96   | 92   | 2462 | 5    |
| Adj No. of Lanes              | 0                                                                                  | 1     | 0    | 1    | 1    | 0     | 1    | 2    | 0    | 1    | 2    | 0    |
| Peak Hour Factor              | 0.92                                                                               | 0.92  | 0.92 | 0.92 | 0.92 | 0.92  | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, %          | 2                                                                                  | 2     | 2    | 2    | 2    | 2     | 2    | 2    | 2    | 2    | 2    | 2    |
| Cap, veh/h                    | 156                                                                                | 2     | 10   | 176  | 110  | 44    | 22   | 2631 | 126  | 116  | 2964 | 6    |
| Arrive On Green               | 0.09                                                                               | 0.00  | 0.08 | 0.09 | 0.09 | 0.08  | 0.02 | 1.00 | 1.00 | 0.07 | 0.82 | 0.81 |
| Sat Flow, veh/h               | 1244                                                                               | 24    | 115  | 1410 | 1267 | 507   | 1774 | 3439 | 164  | 1774 | 3624 | 7    |
| Grp Volume(v), veh/h          | 12                                                                                 | 0     | 0    | 98   | 0    | 7     | 11   | 1019 | 1072 | 92   | 1202 | 1265 |
| Grp Sat Flow(s),veh/h/ln      | 1384                                                                               | 0     | 0    | 1410 | 0    | 1773  | 1774 | 1770 | 1834 | 1774 | 1770 | 1861 |
| Q Serve(g_s), s               | 0.9                                                                                | 0.0   | 0.0  | 8.1  | 0.0  | 0.5   | 0.9  | 0.0  | 0.0  | 7.4  | 55.9 | 56.0 |
| Cycle Q Clear(g_c), s         | 1.4                                                                                | 0.0   | 0.0  | 9.5  | 0.0  | 0.5   | 0.9  | 0.0  | 0.0  | 7.4  | 55.9 | 56.0 |
| Prop In Lane                  | 0.92                                                                               |       | 0.08 | 1.00 |      | 0.29  | 1.00 |      | 0.09 | 1.00 |      | 0.00 |
| Lane Grp Cap(c), veh/h        | 168                                                                                | 0     | 0    | 176  | 0    | 154   | 22   | 1354 | 1403 | 116  | 1447 | 1522 |
| V/C Ratio(X)                  | 0.07                                                                               | 0.00  | 0.00 | 0.56 | 0.00 | 0.05  | 0.50 | 0.75 | 0.76 | 0.79 | 0.83 | 0.83 |
| Avail Cap(c_a), veh/h         | 279                                                                                | 0     | 0    | 287  | 0    | 294   | 61   | 1354 | 1403 | 184  | 1447 | 1522 |
| HCM Platoon Ratio             | 1.00                                                                               | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I)            | 1.00                                                                               | 0.00  | 0.00 | 1.00 | 0.00 | 1.00  | 0.60 | 0.60 | 0.60 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh      | 61.2                                                                               | 0.0   | 0.0  | 64.6 | 0.0  | 60.8  | 70.3 | 0.0  | 0.0  | 66.8 | 7.5  | 7.5  |
| Incr Delay (d2), s/veh        | 0.2                                                                                | 0.0   | 0.0  | 2.7  | 0.0  | 0.1   | 3.9  | 2.4  | 2.4  | 4.7  | 5.7  | 5.4  |
| Initial Q Delay(d3),s/veh     | 0.0                                                                                | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln      | 0.5                                                                                | 0.0   | 0.0  | 4.0  | 0.0  | 0.3   | 0.5  | 0.9  | 0.9  | 3.8  | 29.0 | 30.4 |
| LnGrp Delay(d),s/veh          | 61.4                                                                               | 0.0   | 0.0  | 67.4 | 0.0  | 60.9  | 74.2 | 2.4  | 2.4  | 71.5 | 13.2 | 12.9 |
| LnGrp LOS                     | E                                                                                  |       |      | E    |      | E     | E    | A    | A    | E    | B    | B    |
| Approach Vol, veh/h           | 12                                                                                 |       |      | 105  |      |       | 2102 |      |      | 2559 |      |      |
| Approach Delay, s/veh         | 61.4                                                                               |       |      | 66.9 |      |       | 2.8  |      |      | 15.1 |      |      |
| Approach LOS                  | E                                                                                  |       |      | E    |      |       | A    |      |      | B    |      |      |
| Timer                         | 1                                                                                  | 2     | 3    | 4    | 5    | 6     | 7    | 8    |      |      |      |      |
| Assigned Phs                  | 1                                                                                  | 2     |      | 4    | 5    | 6     |      | 8    |      |      |      |      |
| Phs Duration (G+Y+Rc), s      | 5.8                                                                                | 122.6 |      | 16.6 | 13.5 | 114.9 |      | 16.6 |      |      |      |      |
| Change Period (Y+Rc), s       | 4.0                                                                                | 5.0   |      | 5.0  | 4.0  | 5.0   |      | 5.0  |      |      |      |      |
| Max Green Setting (Gmax), s   | 5.0                                                                                | 103.0 |      | 23.0 | 15.0 | 93.0  |      | 23.0 |      |      |      |      |
| Max Q Clear Time (g_c+1/3), s | 12.5                                                                               | 58.0  |      | 11.5 | 9.4  | 2.0   |      | 3.4  |      |      |      |      |
| Green Ext Time (p_c), s       | 0.0                                                                                | 42.0  |      | 0.2  | 0.1  | 62.9  |      | 0.0  |      |      |      |      |
| Intersection Summary          |                                                                                    |       |      |      |      |       |      |      |      |      |      |      |
| HCM 2010 Ctrl Delay           | 11.0                                                                               |       |      |      |      |       |      |      |      |      |      |      |
| HCM 2010 LOS                  | B                                                                                  |       |      |      |      |       |      |      |      |      |      |      |

# HCM 2010 Signalized Intersection Summary

## 9: Honoapiilani Highway & Front Street/Flemming Road

08/16/2017

|                               | <div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div> |                                                                                   |      |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                      | EBL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | EBT                                                                               | EBR  | WBL  | WBT                                                                               | WBR  | NBL                                                                               | NBT                                                                               | NBR  | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |      |      |  |      |  |  |      |  |  |  |
| Traffic Volume (veh/h)        | 180                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 15                                                                                | 10   | 60   | 5                                                                                 | 10   | 5                                                                                 | 1755                                                                              | 20   | 5                                                                                   | 1920                                                                                | 325                                                                                 |
| Future Volume (veh/h)         | 180                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 15                                                                                | 10   | 60   | 5                                                                                 | 10   | 5                                                                                 | 1755                                                                              | 20   | 5                                                                                   | 1920                                                                                | 325                                                                                 |
| Number                        | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 8                                                                                 | 18   | 7    | 4                                                                                 | 14   | 1                                                                                 | 6                                                                                 | 16   | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0                                                                                 | 0    | 0    | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                   | 1.00 | 1.00 |                                                                                   | 1.00 | 1.00                                                                              |                                                                                   | 1.00 | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.00                                                                              | 1.00 | 1.00 | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1863                                                                              | 1900 | 1900 | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 196                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 16                                                                                | 9    | 65   | 5                                                                                 | 7    | 5                                                                                 | 1908                                                                              | 21   | 5                                                                                   | 2087                                                                                | 275                                                                                 |
| Adj No. of Lanes              | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1                                                                                 | 0    | 0    | 1                                                                                 | 0    | 1                                                                                 | 2                                                                                 | 0    | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.92                                                                              | 0.92 | 0.92 | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2                                                                                 | 2    | 2    | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 268                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 18                                                                                | 10   | 275  | 22                                                                                | 25   | 7                                                                                 | 2674                                                                              | 29   | 7                                                                                   | 2639                                                                                | 1180                                                                                |
| Arrive On Green               | 0.17                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.17                                                                              | 0.16 | 0.17 | 0.17                                                                              | 0.16 | 0.01                                                                              | 0.99                                                                              | 0.98 | 0.00                                                                                | 0.75                                                                                | 0.75                                                                                |
| Sat Flow, veh/h               | 1320                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 108                                                                               | 61   | 1367 | 130                                                                               | 150  | 1774                                                                              | 3586                                                                              | 39   | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h          | 221                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0                                                                                 | 0    | 77   | 0                                                                                 | 0    | 5                                                                                 | 940                                                                               | 989  | 5                                                                                   | 2087                                                                                | 275                                                                                 |
| Grp Sat Flow(s),veh/h/ln      | 1488                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0                                                                                 | 0    | 1647 | 0                                                                                 | 0    | 1774                                                                              | 1770                                                                              | 1856 | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s               | 15.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.0                                                                               | 0.0  | 0.0  | 0.0                                                                               | 0.0  | 0.4                                                                               | 2.2                                                                               | 2.3  | 0.4                                                                                 | 53.0                                                                                | 7.8                                                                                 |
| Cycle Q Clear(g_c), s         | 20.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.0                                                                               | 0.0  | 5.8  | 0.0                                                                               | 0.0  | 0.4                                                                               | 2.2                                                                               | 2.3  | 0.4                                                                                 | 53.0                                                                                | 7.8                                                                                 |
| Prop In Lane                  | 0.89                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                   | 0.04 | 0.84 |                                                                                   | 0.09 | 1.00                                                                              |                                                                                   | 0.02 | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 297                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0                                                                                 | 0    | 322  | 0                                                                                 | 0    | 7                                                                                 | 1319                                                                              | 1384 | 7                                                                                   | 2639                                                                                | 1180                                                                                |
| V/C Ratio(X)                  | 0.74                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.00                                                                              | 0.00 | 0.24 | 0.00                                                                              | 0.00 | 0.75                                                                              | 0.71                                                                              | 0.71 | 0.75                                                                                | 0.79                                                                                | 0.23                                                                                |
| Avail Cap(c_a), veh/h         | 362                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0                                                                                 | 0    | 387  | 0                                                                                 | 0    | 37                                                                                | 1319                                                                              | 1384 | 37                                                                                  | 2639                                                                                | 1180                                                                                |
| HCM Platoon Ratio             | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.00                                                                              | 1.00 | 1.00 | 1.00                                                                              | 1.00 | 1.33                                                                              | 1.33                                                                              | 1.33 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.00                                                                              | 0.00 | 1.00 | 0.00                                                                              | 0.00 | 0.61                                                                              | 0.61                                                                              | 0.61 | 0.40                                                                                | 0.40                                                                                | 0.40                                                                                |
| Uniform Delay (d), s/veh      | 58.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.0                                                                               | 0.0  | 52.6 | 0.0                                                                               | 0.0  | 72.1                                                                              | 0.2                                                                               | 0.2  | 72.2                                                                                | 11.4                                                                                | 5.7                                                                                 |
| Incr Delay (d2), s/veh        | 6.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.0                                                                               | 0.0  | 0.4  | 0.0                                                                               | 0.0  | 30.7                                                                              | 2.0                                                                               | 2.0  | 21.5                                                                                | 1.0                                                                                 | 0.2                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.0                                                                               | 0.0  | 0.0  | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 9.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.0                                                                               | 0.0  | 2.7  | 0.0                                                                               | 0.0  | 0.3                                                                               | 1.1                                                                               | 1.1  | 0.2                                                                                 | 25.9                                                                                | 3.4                                                                                 |
| LnGrp Delay(d),s/veh          | 65.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.0                                                                               | 0.0  | 53.0 | 0.0                                                                               | 0.0  | 102.8                                                                             | 2.2                                                                               | 2.1  | 93.6                                                                                | 12.5                                                                                | 5.9                                                                                 |
| LnGrp LOS                     | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                   |      | D    |                                                                                   |      | F                                                                                 | A                                                                                 | A    | F                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h           | 221                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                   |      |      | 77                                                                                |      | 1934                                                                              |                                                                                   |      |                                                                                     | 2367                                                                                |                                                                                     |
| Approach Delay, s/veh         | 65.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                   |      |      | 53.0                                                                              |      | 2.4                                                                               |                                                                                   |      |                                                                                     | 11.9                                                                                |                                                                                     |
| Approach LOS                  | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                   |      |      | D                                                                                 |      | A                                                                                 |                                                                                   |      |                                                                                     | B                                                                                   |                                                                                     |
| Timer                         | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2                                                                                 | 3    | 4    | 5                                                                                 | 6    | 7                                                                                 | 8                                                                                 |      |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2                                                                                 |      |      | 4                                                                                 | 5    | 6                                                                                 | 8                                                                                 |      |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 4.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 112.1                                                                             |      |      | 28.3                                                                              | 4.5  | 112.1                                                                             | 28.3                                                                              |      |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 5.0                                                                               |      |      | 5.0                                                                               | 4.0  | 5.0                                                                               | 5.0                                                                               |      |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 98.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                   |      |      | 30.0                                                                              | 3.0  | 98.0                                                                              | 30.0                                                                              |      |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1/4), s | 55.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                   |      |      | 7.8                                                                               | 2.4  | 4.3                                                                               | 22.9                                                                              |      |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 40.2                                                                              |      |      | 0.2                                                                               | 0.0  | 70.7                                                                              | 0.5                                                                               |      |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                   |      |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           | 11.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                   |      |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  | B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                   |      |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 10: Honoapiilani Highway & Kapunakea Street

08/16/2017

|                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                              |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)       | 180                                                                               | 35                                                                                | 45                                                                                | 95                                                                                | 25                                                                                | 20                                                                                | 55                                                                                | 1560                                                                              | 105                                                                               | 25                                                                                  | 1855                                                                                | 150                                                                                 |
| Future Volume (veh/h)        | 180                                                                               | 35                                                                                | 45                                                                                | 95                                                                                | 25                                                                                | 20                                                                                | 55                                                                                | 1560                                                                              | 105                                                                               | 25                                                                                  | 1855                                                                                | 150                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                              |                                                                                   | 0.98                                                                              | 0.99                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 196                                                                               | 38                                                                                | 10                                                                                | 103                                                                               | 27                                                                                | 2                                                                                 | 60                                                                                | 1696                                                                              | 111                                                                               | 27                                                                                  | 2016                                                                                | 159                                                                                 |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 262                                                                               | 42                                                                                | 304                                                                               | 348                                                                               | 336                                                                               | 25                                                                                | 73                                                                                | 2367                                                                              | 154                                                                               | 34                                                                                  | 2260                                                                                | 176                                                                                 |
| Arrive On Green              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.19                                                                              | 0.08                                                                              | 1.00                                                                              | 1.00                                                                              | 0.04                                                                                | 1.00                                                                                | 1.00                                                                                |
| Sat Flow, veh/h              | 1102                                                                              | 214                                                                               | 1545                                                                              | 1347                                                                              | 1710                                                                              | 127                                                                               | 1774                                                                              | 3374                                                                              | 219                                                                               | 1774                                                                                | 3327                                                                                | 259                                                                                 |
| Grp Volume(v), veh/h         | 234                                                                               | 0                                                                                 | 10                                                                                | 103                                                                               | 0                                                                                 | 29                                                                                | 60                                                                                | 883                                                                               | 924                                                                               | 27                                                                                  | 1060                                                                                | 1115                                                                                |
| Grp Sat Flow(s),veh/h/ln     | 1316                                                                              | 0                                                                                 | 1545                                                                              | 1347                                                                              | 0                                                                                 | 1837                                                                              | 1774                                                                              | 1770                                                                              | 1824                                                                              | 1774                                                                                | 1770                                                                                | 1816                                                                                |
| Q Serve(g_s), s              | 23.6                                                                              | 0.0                                                                               | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 1.9                                                                               | 4.8                                                                               | 0.0                                                                               | 0.0                                                                               | 2.2                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Cycle Q Clear(g_c), s        | 25.5                                                                              | 0.0                                                                               | 0.8                                                                               | 8.3                                                                               | 0.0                                                                               | 1.9                                                                               | 4.8                                                                               | 0.0                                                                               | 0.0                                                                               | 2.2                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Prop In Lane                 | 0.84                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.07                                                                              | 1.00                                                                              |                                                                                   | 0.12                                                                              | 1.00                                                                                |                                                                                     | 0.14                                                                                |
| Lane Grp Cap(c), veh/h       | 304                                                                               | 0                                                                                 | 304                                                                               | 348                                                                               | 0                                                                                 | 361                                                                               | 73                                                                                | 1241                                                                              | 1279                                                                              | 34                                                                                  | 1202                                                                                | 1234                                                                                |
| V/C Ratio(X)                 | 0.77                                                                              | 0.00                                                                              | 0.03                                                                              | 0.30                                                                              | 0.00                                                                              | 0.08                                                                              | 0.82                                                                              | 0.71                                                                              | 0.72                                                                              | 0.79                                                                                | 0.88                                                                                | 0.90                                                                                |
| Avail Cap(c_a), veh/h        | 309                                                                               | 0                                                                                 | 309                                                                               | 353                                                                               | 0                                                                                 | 367                                                                               | 73                                                                                | 1241                                                                              | 1279                                                                              | 73                                                                                  | 1202                                                                                | 1234                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 2.00                                                                              | 2.00                                                                              | 2.00                                                                              | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.38                                                                              | 0.38                                                                              | 0.38                                                                              | 0.51                                                                                | 0.51                                                                                | 0.51                                                                                |
| Uniform Delay (d), s/veh     | 57.9                                                                              | 0.0                                                                               | 47.1                                                                              | 50.1                                                                              | 0.0                                                                               | 47.6                                                                              | 66.0                                                                              | 0.0                                                                               | 0.0                                                                               | 69.4                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Incr Delay (d2), s/veh       | 11.0                                                                              | 0.0                                                                               | 0.0                                                                               | 0.5                                                                               | 0.0                                                                               | 0.1                                                                               | 21.9                                                                              | 1.3                                                                               | 1.4                                                                               | 7.7                                                                                 | 5.1                                                                                 | 6.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 10.1                                                                              | 0.0                                                                               | 0.3                                                                               | 3.6                                                                               | 0.0                                                                               | 1.0                                                                               | 2.8                                                                               | 0.5                                                                               | 0.5                                                                               | 1.1                                                                                 | 1.7                                                                                 | 2.1                                                                                 |
| LnGrp Delay(d),s/veh         | 68.9                                                                              | 0.0                                                                               | 47.1                                                                              | 50.6                                                                              | 0.0                                                                               | 47.7                                                                              | 87.9                                                                              | 1.3                                                                               | 1.4                                                                               | 77.1                                                                                | 5.1                                                                                 | 6.1                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 |                                                                                   | D                                                                                 | F                                                                                 | A                                                                                 | A                                                                                 | E                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 244                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 132                                                                               |                                                                                   | 1867                                                                              |                                                                                   | 2202                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 68.0                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 50.0                                                                              |                                                                                   | 4.1                                                                               |                                                                                   | 6.5                                                                                 |                                                                                     |                                                                                     |
| Approach LOS                 | E                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                   | A                                                                                 |                                                                                   | A                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 10.0                                                                              | 102.5                                                                             |                                                                                   | 32.5                                                                              | 6.8                                                                               | 105.7                                                                             |                                                                                   | 32.5                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 97.0                                                                              |                                                                                   |                                                                                   | 28.0                                                                              | 6.0                                                                               | 97.0                                                                              |                                                                                   | 28.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+10, s) | 10.8                                                                              | 2.0                                                                               |                                                                                   | 10.3                                                                              | 4.2                                                                               | 2.0                                                                               |                                                                                   | 27.5                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 67.5                                                                              |                                                                                   | 0.4                                                                               | 0.0                                                                               | 45.2                                                                              |                                                                                   | 0.1                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          | 10.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 11: Honoapiilani Highway & Keawe Street

08/16/2017

|                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                              |  |  |  |  |  |  |  |  |   |  |  |  |
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                                | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 60                                                                                | 185                                                                               | 60                                                                                | 125                                                                               | 110                                                                               | 705                                                                               | 55                                                                                | 950                                                                               | 195                                                                                | 630                                                                                 | 1230                                                                                | 65                                                                                  |
| Future Volume (veh/h)        | 60                                                                                | 185                                                                               | 60                                                                                | 125                                                                               | 110                                                                               | 705                                                                               | 55                                                                                | 950                                                                               | 195                                                                                | 630                                                                                 | 1230                                                                                | 65                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                 | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                               | 1.00                                                                                |                                                                                     | 0.99                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 65                                                                                | 201                                                                               | 12                                                                                | 136                                                                               | 120                                                                               | 445                                                                               | 60                                                                                | 1033                                                                              | 135                                                                                | 685                                                                                 | 1337                                                                                | 69                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 2                                                                                 | 1                                                                                  | 2                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 100                                                                               | 256                                                                               | 341                                                                               | 219                                                                               | 578                                                                               | 483                                                                               | 77                                                                                | 1400                                                                              | 622                                                                                | 727                                                                                 | 1930                                                                                | 99                                                                                  |
| Arrive On Green              | 0.22                                                                              | 0.22                                                                              | 0.22                                                                              | 0.06                                                                              | 0.31                                                                              | 0.31                                                                              | 0.04                                                                              | 0.40                                                                              | 0.40                                                                               | 0.42                                                                                | 1.00                                                                                | 1.00                                                                                |
| Sat Flow, veh/h              | 313                                                                               | 1163                                                                              | 1545                                                                              | 1774                                                                              | 1863                                                                              | 1556                                                                              | 1774                                                                              | 3539                                                                              | 1571                                                                               | 3442                                                                                | 3424                                                                                | 176                                                                                 |
| Grp Volume(v), veh/h         | 266                                                                               | 0                                                                                 | 12                                                                                | 136                                                                               | 120                                                                               | 445                                                                               | 60                                                                                | 1033                                                                              | 135                                                                                | 685                                                                                 | 690                                                                                 | 716                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1476                                                                              | 0                                                                                 | 1545                                                                              | 1774                                                                              | 1863                                                                              | 1556                                                                              | 1774                                                                              | 1770                                                                              | 1571                                                                               | 1721                                                                                | 1770                                                                                | 1830                                                                                |
| Q Serve(g_s), s              | 21.2                                                                              | 0.0                                                                               | 0.9                                                                               | 8.5                                                                               | 6.9                                                                               | 40.1                                                                              | 4.9                                                                               | 36.1                                                                              | 8.2                                                                                | 27.7                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Cycle Q Clear(g_c), s        | 24.6                                                                              | 0.0                                                                               | 0.9                                                                               | 8.5                                                                               | 6.9                                                                               | 40.1                                                                              | 4.9                                                                               | 36.1                                                                              | 8.2                                                                                | 27.7                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Prop In Lane                 | 0.24                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                               | 1.00                                                                                |                                                                                     | 0.10                                                                                |
| Lane Grp Cap(c), veh/h       | 356                                                                               | 0                                                                                 | 341                                                                               | 219                                                                               | 578                                                                               | 483                                                                               | 77                                                                                | 1400                                                                              | 622                                                                                | 727                                                                                 | 998                                                                                 | 1032                                                                                |
| V/C Ratio(X)                 | 0.75                                                                              | 0.00                                                                              | 0.04                                                                              | 0.62                                                                              | 0.21                                                                              | 0.92                                                                              | 0.78                                                                              | 0.74                                                                              | 0.22                                                                               | 0.94                                                                                | 0.69                                                                                | 0.69                                                                                |
| Avail Cap(c_a), veh/h        | 426                                                                               | 0                                                                                 | 415                                                                               | 219                                                                               | 668                                                                               | 558                                                                               | 110                                                                               | 1400                                                                              | 622                                                                                | 807                                                                                 | 998                                                                                 | 1032                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.88                                                                              | 0.88                                                                              | 0.88                                                                               | 0.32                                                                                | 0.32                                                                                | 0.32                                                                                |
| Uniform Delay (d), s/veh     | 53.2                                                                              | 0.0                                                                               | 44.4                                                                              | 41.6                                                                              | 36.9                                                                              | 48.3                                                                              | 68.7                                                                              | 37.4                                                                              | 29.0                                                                               | 41.0                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Incr Delay (d2), s/veh       | 5.8                                                                               | 0.0                                                                               | 0.0                                                                               | 5.3                                                                               | 0.2                                                                               | 19.4                                                                              | 11.0                                                                              | 3.1                                                                               | 0.7                                                                                | 7.3                                                                                 | 1.3                                                                                 | 1.3                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 10.7                                                                              | 0.0                                                                               | 0.4                                                                               | 4.4                                                                               | 3.6                                                                               | 19.8                                                                              | 2.6                                                                               | 18.3                                                                              | 3.7                                                                                | 13.8                                                                                | 0.4                                                                                 | 0.4                                                                                 |
| LnGrp Delay(d),s/veh         | 59.0                                                                              | 0.0                                                                               | 44.4                                                                              | 46.9                                                                              | 37.0                                                                              | 67.7                                                                              | 79.7                                                                              | 40.5                                                                              | 29.7                                                                               | 48.3                                                                                | 1.3                                                                                 | 1.3                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 | D                                                                                 | E                                                                                 | E                                                                                 | D                                                                                 | C                                                                                  | D                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 278                                                                               |                                                                                   |                                                                                   |                                                                                   | 701                                                                               |                                                                                   |                                                                                   |                                                                                   | 1228                                                                               |                                                                                     | 2091                                                                                |                                                                                     |
| Approach Delay, s/veh        | 58.4                                                                              |                                                                                   |                                                                                   |                                                                                   | 58.4                                                                              |                                                                                   |                                                                                   |                                                                                   | 41.2                                                                               |                                                                                     | 16.7                                                                                |                                                                                     |
| Approach LOS                 | E                                                                                 |                                                                                   |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                  |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 10.3                                                                              | 85.8                                                                              | 13.0                                                                              | 36.0                                                                              | 34.6                                                                              | 61.4                                                                              | 49.0                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 71.0                                                                              | 8.0                                                                               | 38.0                                                                              | 34.0                                                                              | 46.0                                                                              | 51.0                                                                              |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+10), s | 10.5                                                                              | 2.0                                                                               | 10.5                                                                              | 26.6                                                                              | 29.7                                                                              | 38.1                                                                              | 42.1                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 24.6                                                                              | 0.0                                                                               | 1.0                                                                               | 1.0                                                                               | 5.5                                                                               | 1.9                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 33.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |

Intersection

Int Delay, s/veh 0

| Movement                 | WBL  | WBR                                                                               | NBT                                                                               | NBR                                                                               | SBL  | SBT                                                                                 |
|--------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|
| Lane Configurations      |      |  |  |  |      |  |
| Traffic Vol, veh/h       | 0    | 0                                                                                 | 895                                                                               | 0                                                                                 | 0    | 790                                                                                 |
| Future Vol, veh/h        | 0    | 0                                                                                 | 895                                                                               | 0                                                                                 | 0    | 790                                                                                 |
| Conflicting Peds, #/hr   | 0    | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   |
| Sign Control             | Stop | Stop                                                                              | Free                                                                              | Free                                                                              | Free | Free                                                                                |
| RT Channelized           | -    | None                                                                              | -                                                                                 | None                                                                              | -    | None                                                                                |
| Storage Length           | -    | 0                                                                                 | -                                                                                 | 0                                                                                 | -    | -                                                                                   |
| Veh in Median Storage, # | 0    | -                                                                                 | 0                                                                                 | -                                                                                 | -    | 0                                                                                   |
| Grade, %                 | 0    | -                                                                                 | 0                                                                                 | -                                                                                 | -    | 0                                                                                   |
| Peak Hour Factor         | 92   | 92                                                                                | 92                                                                                | 92                                                                                | 92   | 92                                                                                  |
| Heavy Vehicles, %        | 2    | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                   |
| Mvmt Flow                | 0    | 0                                                                                 | 973                                                                               | 0                                                                                 | 0    | 859                                                                                 |

| Major/Minor          | Minor1 | Major1 | Major2 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | -      | 973    | 0 0    |
| Stage 1              | -      | -      | - -    |
| Stage 2              | -      | -      | - -    |
| Critical Hdwy        | -      | 6.22   | - -    |
| Critical Hdwy Stg 1  | -      | -      | - -    |
| Critical Hdwy Stg 2  | -      | -      | - -    |
| Follow-up Hdwy       | -      | 3.318  | - -    |
| Pot Cap-1 Maneuver   | 0      | 306    | 0 -    |
| Stage 1              | 0      | -      | 0 -    |
| Stage 2              | 0      | -      | 0 -    |
| Platoon blocked, %   |        |        | - -    |
| Mov Cap-1 Maneuver   | -      | 306    | - -    |
| Mov Cap-2 Maneuver   | -      | -      | - -    |
| Stage 1              | -      | -      | - -    |
| Stage 2              | -      | -      | - -    |

| Approach             | WB | NB | SB |
|----------------------|----|----|----|
| HCM Control Delay, s | 0  | 0  | 0  |
| HCM LOS              | A  |    |    |

| Minor Lane/Major Mvmt | NBT | NBRWBLn1 | SBT |
|-----------------------|-----|----------|-----|
| Capacity (veh/h)      | -   | -        | -   |
| HCM Lane V/C Ratio    | -   | -        | -   |
| HCM Control Delay (s) | -   | 0        | -   |
| HCM Lane LOS          | -   | A        | -   |
| HCM 95th %tile Q(veh) | -   | -        | -   |

| Intersection             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh         | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Movement                 | WBL                                                                               | WBR                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 |
| Lane Configurations      |  |  |  |  |  |  |
| Traffic Vol, veh/h       | 0                                                                                 | 0                                                                                 | 1005                                                                              | 0                                                                                 | 0                                                                                   | 890                                                                                 |
| Future Vol, veh/h        | 0                                                                                 | 0                                                                                 | 1005                                                                              | 0                                                                                 | 0                                                                                   | 890                                                                                 |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   |
| Sign Control             | Stop                                                                              | Stop                                                                              | Free                                                                              | Free                                                                              | Free                                                                                | Free                                                                                |
| RT Channelized           | -                                                                                 | None                                                                              | -                                                                                 | None                                                                              | -                                                                                   | None                                                                                |
| Storage Length           | 0                                                                                 | 100                                                                               | -                                                                                 | 100                                                                               | 100                                                                                 | -                                                                                   |
| Veh in Median Storage, # | 0                                                                                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                   | 0                                                                                   |
| Grade, %                 | 0                                                                                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                   | 0                                                                                   |
| Peak Hour Factor         | 92                                                                                | 92                                                                                | 92                                                                                | 92                                                                                | 92                                                                                  | 92                                                                                  |
| Heavy Vehicles, %        | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   |
| Mvmt Flow                | 0                                                                                 | 0                                                                                 | 1092                                                                              | 0                                                                                 | 0                                                                                   | 967                                                                                 |
| Major/Minor              | Minor1                                                                            | Major1                                                                            |                                                                                   | Major2                                                                            |                                                                                     |                                                                                     |
| Conflicting Flow All     | 2059                                                                              | 1092                                                                              | 0                                                                                 | 0                                                                                 | 1092                                                                                | 0                                                                                   |
| Stage 1                  | 1092                                                                              | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 2                  | 967                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Critical Hdwy            | 6.42                                                                              | 6.22                                                                              | -                                                                                 | -                                                                                 | 4.12                                                                                | -                                                                                   |
| Critical Hdwy Stg 1      | 5.42                                                                              | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Critical Hdwy Stg 2      | 5.42                                                                              | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Follow-up Hdwy           | 3.518                                                                             | 3.318                                                                             | -                                                                                 | -                                                                                 | 2.218                                                                               | -                                                                                   |
| Pot Cap-1 Maneuver       | 60                                                                                | 261                                                                               | -                                                                                 | -                                                                                 | 639                                                                                 | -                                                                                   |
| Stage 1                  | 322                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 2                  | 369                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Platoon blocked, %       |                                                                                   |                                                                                   | -                                                                                 | -                                                                                 |                                                                                     | -                                                                                   |
| Mov Cap-1 Maneuver       | 60                                                                                | 261                                                                               | -                                                                                 | -                                                                                 | 639                                                                                 | -                                                                                   |
| Mov Cap-2 Maneuver       | 184                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 1                  | 322                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 2                  | 369                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Approach                 | WB                                                                                | NB                                                                                |                                                                                   | SB                                                                                |                                                                                     |                                                                                     |
| HCM Control Delay, s     | 0                                                                                 | 0                                                                                 |                                                                                   | 0                                                                                 |                                                                                     |                                                                                     |
| HCM LOS                  | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Minor Lane/Major Mvmt    | NBT                                                                               | NBRWBLn1WBLn2                                                                     | SBL                                                                               | SBT                                                                               |                                                                                     |                                                                                     |
| Capacity (veh/h)         | -                                                                                 | -                                                                                 | -                                                                                 | 639                                                                               | -                                                                                   |                                                                                     |
| HCM Lane V/C Ratio       | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   |                                                                                     |
| HCM Control Delay (s)    | -                                                                                 | -                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   |                                                                                     |
| HCM Lane LOS             | -                                                                                 | -                                                                                 | A                                                                                 | A                                                                                 | A                                                                                   |                                                                                     |
| HCM 95th %tile Q(veh)    | -                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -                                                                                   |                                                                                     |

HCM 2010 TWSC  
14: Road A & Akahele Street

08/16/2017

| Intersection             |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |      |                                                                                     |      |      |                                                                                     |      |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|------|-------------------------------------------------------------------------------------|------|------|-------------------------------------------------------------------------------------|------|
| Int Delay, s/veh         | 3.2                                                                               |                                                                                   |      |                                                                                   |                                                                                   |      |      |                                                                                     |      |      |                                                                                     |      |
| Movement                 | EBL                                                                               | EBT                                                                               | EBR  | WBL                                                                               | WBT                                                                               | WBR  | NBL  | NBT                                                                                 | NBR  | SBL  | SBT                                                                                 | SBR  |
| Lane Configurations      |  |  |      |  |  |      |      |  |      |      |  |      |
| Traffic Vol, veh/h       | 25                                                                                | 60                                                                                | 15   | 5                                                                                 | 45                                                                                | 5    | 10   | 5                                                                                   | 5    | 5    | 5                                                                                   | 15   |
| Future Vol, veh/h        | 25                                                                                | 60                                                                                | 15   | 5                                                                                 | 45                                                                                | 5    | 10   | 5                                                                                   | 5    | 5    | 5                                                                                   | 15   |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0    | 0                                                                                   | 0    | 0    | 0                                                                                   | 0    |
| Sign Control             | Free                                                                              | Free                                                                              | Free | Free                                                                              | Free                                                                              | Free | Stop | Stop                                                                                | Stop | Stop | Stop                                                                                | Stop |
| RT Channelized           | -                                                                                 | -                                                                                 | None | -                                                                                 | -                                                                                 | None | -    | -                                                                                   | None | -    | -                                                                                   | None |
| Storage Length           | 100                                                                               | -                                                                                 | -    | 100                                                                               | -                                                                                 | -    | -    | -                                                                                   | -    | -    | -                                                                                   | -    |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | -    | -                                                                                 | 0                                                                                 | -    | -    | 0                                                                                   | -    | -    | 0                                                                                   | -    |
| Grade, %                 | -                                                                                 | 0                                                                                 | -    | -                                                                                 | 0                                                                                 | -    | -    | 0                                                                                   | -    | -    | 0                                                                                   | -    |
| Peak Hour Factor         | 92                                                                                | 92                                                                                | 92   | 92                                                                                | 92                                                                                | 92   | 92   | 92                                                                                  | 92   | 92   | 92                                                                                  | 92   |
| Heavy Vehicles, %        | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    | 2    | 2                                                                                   | 2    | 2    | 2                                                                                   | 2    |
| Mvmt Flow                | 27                                                                                | 65                                                                                | 16   | 5                                                                                 | 49                                                                                | 5    | 11   | 5                                                                                   | 5    | 5    | 5                                                                                   | 16   |

| Major/Minor          | Major1 |   |   | Major2 |   |   | Minor1 |       |       | Minor2 |       |       |
|----------------------|--------|---|---|--------|---|---|--------|-------|-------|--------|-------|-------|
| Conflicting Flow All | 54     | 0 | 0 | 81     | 0 | 0 | 199    | 191   | 73    | 194    | 197   | 52    |
| Stage 1              | -      | - | - | -      | - | - | 127    | 127   | -     | 62     | 62    | -     |
| Stage 2              | -      | - | - | -      | - | - | 72     | 64    | -     | 132    | 135   | -     |
| Critical Hdwy        | 4.12   | - | - | 4.12   | - | - | 7.12   | 6.52  | 6.22  | 7.12   | 6.52  | 6.22  |
| Critical Hdwy Stg 1  | -      | - | - | -      | - | - | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Critical Hdwy Stg 2  | -      | - | - | -      | - | - | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Follow-up Hdwy       | 2.218  | - | - | 2.218  | - | - | 3.518  | 4.018 | 3.318 | 3.518  | 4.018 | 3.318 |
| Pot Cap-1 Maneuver   | 1551   | - | - | 1517   | - | - | 760    | 704   | 989   | 765    | 699   | 1016  |
| Stage 1              | -      | - | - | -      | - | - | 877    | 791   | -     | 949    | 843   | -     |
| Stage 2              | -      | - | - | -      | - | - | 938    | 842   | -     | 871    | 785   | -     |
| Platoon blocked, %   |        | - | - |        | - | - |        |       |       |        |       |       |
| Mov Cap-1 Maneuver   | 1551   | - | - | 1517   | - | - | 732    | 690   | 989   | 744    | 685   | 1016  |
| Mov Cap-2 Maneuver   | -      | - | - | -      | - | - | 732    | 690   | -     | 744    | 685   | -     |
| Stage 1              | -      | - | - | -      | - | - | 862    | 778   | -     | 933    | 840   | -     |
| Stage 2              | -      | - | - | -      | - | - | 914    | 839   | -     | 845    | 772   | -     |

| Approach             | EB  | WB  | NB  | SB  |
|----------------------|-----|-----|-----|-----|
| HCM Control Delay, s | 1.8 | 0.7 | 9.8 | 9.3 |
| HCM LOS              |     |     | A   | A   |

| Minor Lane/Major Mvmt | NBLn1 | EBL   | EBT | EBR | WBL   | WBT | WBR | SBLn1 |
|-----------------------|-------|-------|-----|-----|-------|-----|-----|-------|
| Capacity (veh/h)      | 770   | 1551  | -   | -   | 1517  | -   | -   | 869   |
| HCM Lane V/C Ratio    | 0.028 | 0.018 | -   | -   | 0.004 | -   | -   | 0.031 |
| HCM Control Delay (s) | 9.8   | 7.4   | -   | -   | 7.4   | -   | -   | 9.3   |
| HCM Lane LOS          | A     | A     | -   | -   | A     | -   | -   | A     |
| HCM 95th %tile Q(veh) | 0.1   | 0.1   | -   | -   | 0     | -   | -   | 0.1   |



| Intersection             |        |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
|--------------------------|--------|-----------------------------------------------------------------------------------|------|--------|-----------------------------------------------------------------------------------|------|--------|-------------------------------------------------------------------------------------|-------|--------|-------------------------------------------------------------------------------------|-------|
| Int Delay, s/veh         | 4.2    |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Movement                 | EBL    | EBT                                                                               | EBR  | WBL    | WBT                                                                               | WBR  | NBL    | NBT                                                                                 | NBR   | SBL    | SBT                                                                                 | SBR   |
| Lane Configurations      |        |  |      |        |  |      |        |  |       |        |  |       |
| Traffic Vol, veh/h       | 15     | 15                                                                                | 35   | 5      | 20                                                                                | 5    | 20     | 5                                                                                   | 5     | 5      | 5                                                                                   | 10    |
| Future Vol, veh/h        | 15     | 15                                                                                | 35   | 5      | 20                                                                                | 5    | 20     | 5                                                                                   | 5     | 5      | 5                                                                                   | 10    |
| Conflicting Peds, #/hr   | 0      | 0                                                                                 | 0    | 0      | 0                                                                                 | 0    | 0      | 0                                                                                   | 0     | 0      | 0                                                                                   | 0     |
| Sign Control             | Free   | Free                                                                              | Free | Free   | Free                                                                              | Free | Stop   | Stop                                                                                | Stop  | Stop   | Stop                                                                                | Stop  |
| RT Channelized           | -      | -                                                                                 | None | -      | -                                                                                 | None | -      | -                                                                                   | None  | -      | -                                                                                   | None  |
| Storage Length           | -      | -                                                                                 | -    | -      | -                                                                                 | -    | -      | -                                                                                   | -     | -      | -                                                                                   | -     |
| Veh in Median Storage, # | -      | 0                                                                                 | -    | -      | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Grade, %                 | -      | 0                                                                                 | -    | -      | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Peak Hour Factor         | 92     | 92                                                                                | 92   | 92     | 92                                                                                | 92   | 92     | 92                                                                                  | 92    | 92     | 92                                                                                  | 92    |
| Heavy Vehicles, %        | 2      | 2                                                                                 | 2    | 2      | 2                                                                                 | 2    | 2      | 2                                                                                   | 2     | 2      | 2                                                                                   | 2     |
| Mvmt Flow                | 16     | 16                                                                                | 38   | 5      | 22                                                                                | 5    | 22     | 5                                                                                   | 5     | 5      | 5                                                                                   | 11    |
|                          |        |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Major/Minor              | Major1 |                                                                                   |      | Major2 |                                                                                   |      | Minor1 |                                                                                     |       | Minor2 |                                                                                     |       |
| Conflicting Flow All     | 27     | 0                                                                                 | 0    | 54     | 0                                                                                 | 0    | 110    | 104                                                                                 | 35    | 107    | 121                                                                                 | 25    |
| Stage 1                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 67     | 67                                                                                  | -     | 35     | 35                                                                                  | -     |
| Stage 2                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 43     | 37                                                                                  | -     | 72     | 86                                                                                  | -     |
| Critical Hdwy            | 4.12   | -                                                                                 | -    | 4.12   | -                                                                                 | -    | 7.12   | 6.52                                                                                | 6.22  | 7.12   | 6.52                                                                                | 6.22  |
| Critical Hdwy Stg 1      | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Critical Hdwy Stg 2      | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Follow-up Hdwy           | 2.218  | -                                                                                 | -    | 2.218  | -                                                                                 | -    | 3.518  | 4.018                                                                               | 3.318 | 3.518  | 4.018                                                                               | 3.318 |
| Pot Cap-1 Maneuver       | 1587   | -                                                                                 | -    | 1551   | -                                                                                 | -    | 868    | 786                                                                                 | 1038  | 872    | 769                                                                                 | 1051  |
| Stage 1                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 943    | 839                                                                                 | -     | 981    | 866                                                                                 | -     |
| Stage 2                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 971    | 864                                                                                 | -     | 938    | 824                                                                                 | -     |
| Platoon blocked, %       |        | -                                                                                 | -    |        | -                                                                                 | -    |        |                                                                                     |       |        |                                                                                     |       |
| Mov Cap-1 Maneuver       | 1587   | -                                                                                 | -    | 1551   | -                                                                                 | -    | 846    | 776                                                                                 | 1038  | 855    | 759                                                                                 | 1051  |
| Mov Cap-2 Maneuver       | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 846    | 776                                                                                 | -     | 855    | 759                                                                                 | -     |
| Stage 1                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 934    | 831                                                                                 | -     | 971    | 863                                                                                 | -     |
| Stage 2                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 952    | 861                                                                                 | -     | 918    | 816                                                                                 | -     |
|                          |        |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Approach                 | EB     |                                                                                   |      | WB     |                                                                                   |      | NB     |                                                                                     |       | SB     |                                                                                     |       |
| HCM Control Delay, s     | 1.7    |                                                                                   |      | 1.2    |                                                                                   |      | 9.4    |                                                                                     |       | 9      |                                                                                     |       |
| HCM LOS                  |        |                                                                                   |      |        |                                                                                   |      | A      |                                                                                     |       | A      |                                                                                     |       |
|                          |        |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Minor Lane/Major Mvmt    | NBLn1  | EBL                                                                               | EBT  | EBR    | WBL                                                                               | WBT  | WBR    | SBLn1                                                                               |       |        |                                                                                     |       |
| Capacity (veh/h)         | 860    | 1587                                                                              | -    | -      | 1551                                                                              | -    | -      | 911                                                                                 |       |        |                                                                                     |       |
| HCM Lane V/C Ratio       | 0.038  | 0.01                                                                              | -    | -      | 0.004                                                                             | -    | -      | 0.024                                                                               |       |        |                                                                                     |       |
| HCM Control Delay (s)    | 9.4    | 7.3                                                                               | 0    | -      | 7.3                                                                               | 0    | -      | 9                                                                                   |       |        |                                                                                     |       |
| HCM Lane LOS             | A      | A                                                                                 | A    | -      | A                                                                                 | A    | -      | A                                                                                   |       |        |                                                                                     |       |
| HCM 95th %tile Q(veh)    | 0.1    | 0                                                                                 | -    | -      | 0                                                                                 | -    | -      | 0.1                                                                                 |       |        |                                                                                     |       |



---

## **APPENDIX C**

### LEVEL OF SERVICE CALCULATIONS

- Future Year 2022 Scenario 1 WE Peak
-

# HCM 2010 Signalized Intersection Summary

## 1: Napilihau Street

08/16/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 40                                                                                | 45                                                                                | 335                                                                               | 45                                                                                | 50                                                                                | 20                                                                                | 275                                                                                 | 315                                                                                 | 40                                                                                  | 20                                                                                  | 285                                                                                 | 90                                                                                  |
| Future Volume (veh/h)        | 40                                                                                | 45                                                                                | 335                                                                               | 45                                                                                | 50                                                                                | 20                                                                                | 275                                                                                 | 315                                                                                 | 40                                                                                  | 20                                                                                  | 285                                                                                 | 90                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.99                                                                              | 0.99                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 43                                                                                | 49                                                                                | 35                                                                                | 49                                                                                | 54                                                                                | 10                                                                                | 299                                                                                 | 342                                                                                 | 23                                                                                  | 22                                                                                  | 310                                                                                 | 28                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 191                                                                               | 134                                                                               | 202                                                                               | 263                                                                               | 197                                                                               | 36                                                                                | 386                                                                                 | 916                                                                                 | 777                                                                                 | 29                                                                                  | 541                                                                                 | 459                                                                                 |
| Arrive On Green              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.22                                                                                | 0.49                                                                                | 0.49                                                                                | 0.02                                                                                | 0.29                                                                                | 0.29                                                                                |
| Sat Flow, veh/h              | 549                                                                               | 1038                                                                              | 1566                                                                              | 1298                                                                              | 1526                                                                              | 283                                                                               | 1774                                                                                | 1863                                                                                | 1580                                                                                | 1774                                                                                | 1863                                                                                | 1581                                                                                |
| Grp Volume(v), veh/h         | 92                                                                                | 0                                                                                 | 35                                                                                | 49                                                                                | 0                                                                                 | 64                                                                                | 299                                                                                 | 342                                                                                 | 23                                                                                  | 22                                                                                  | 310                                                                                 | 28                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1587                                                                              | 0                                                                                 | 1566                                                                              | 1298                                                                              | 0                                                                                 | 1809                                                                              | 1774                                                                                | 1863                                                                                | 1580                                                                                | 1774                                                                                | 1863                                                                                | 1581                                                                                |
| Q Serve(g_s), s              | 0.9                                                                               | 0.0                                                                               | 0.9                                                                               | 1.6                                                                               | 0.0                                                                               | 1.4                                                                               | 7.0                                                                                 | 5.0                                                                                 | 0.3                                                                                 | 0.5                                                                                 | 6.2                                                                                 | 0.6                                                                                 |
| Cycle Q Clear(g_c), s        | 2.3                                                                               | 0.0                                                                               | 0.9                                                                               | 3.9                                                                               | 0.0                                                                               | 1.4                                                                               | 7.0                                                                                 | 5.0                                                                                 | 0.3                                                                                 | 0.5                                                                                 | 6.2                                                                                 | 0.6                                                                                 |
| Prop In Lane                 | 0.47                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.16                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 325                                                                               | 0                                                                                 | 202                                                                               | 263                                                                               | 0                                                                                 | 233                                                                               | 386                                                                                 | 916                                                                                 | 777                                                                                 | 29                                                                                  | 541                                                                                 | 459                                                                                 |
| V/C Ratio(X)                 | 0.28                                                                              | 0.00                                                                              | 0.17                                                                              | 0.19                                                                              | 0.00                                                                              | 0.27                                                                              | 0.78                                                                                | 0.37                                                                                | 0.03                                                                                | 0.77                                                                                | 0.57                                                                                | 0.06                                                                                |
| Avail Cap(c_a), veh/h        | 974                                                                               | 0                                                                                 | 853                                                                               | 802                                                                               | 0                                                                                 | 985                                                                               | 1208                                                                                | 3340                                                                                | 2833                                                                                | 604                                                                                 | 2705                                                                                | 2296                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 17.7                                                                              | 0.0                                                                               | 17.1                                                                              | 19.5                                                                              | 0.0                                                                               | 17.3                                                                              | 16.2                                                                                | 7.0                                                                                 | 5.8                                                                                 | 21.6                                                                                | 13.3                                                                                | 11.3                                                                                |
| Incr Delay (d2), s/veh       | 0.5                                                                               | 0.0                                                                               | 0.4                                                                               | 0.3                                                                               | 0.0                                                                               | 0.6                                                                               | 3.4                                                                                 | 0.5                                                                                 | 0.0                                                                                 | 34.5                                                                                | 2.0                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.1                                                                               | 0.0                                                                               | 0.4                                                                               | 0.6                                                                               | 0.0                                                                               | 0.7                                                                               | 3.8                                                                                 | 2.7                                                                                 | 0.1                                                                                 | 0.5                                                                                 | 3.5                                                                                 | 0.3                                                                                 |
| LnGrp Delay(d),s/veh         | 18.1                                                                              | 0.0                                                                               | 17.5                                                                              | 19.9                                                                              | 0.0                                                                               | 18.0                                                                              | 19.6                                                                                | 7.5                                                                                 | 5.8                                                                                 | 56.1                                                                                | 15.3                                                                                | 11.4                                                                                |
| LnGrp LOS                    | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 127                                                                               |                                                                                   |                                                                                   | 113                                                                               |                                                                                   |                                                                                     | 664                                                                                 |                                                                                     |                                                                                     | 360                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 18.0                                                                              |                                                                                   |                                                                                   | 18.8                                                                              |                                                                                   |                                                                                     | 12.9                                                                                |                                                                                     |                                                                                     | 17.5                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.7                                                                               | 27.7                                                                              |                                                                                   | 10.7                                                                              | 14.6                                                                              | 18.8                                                                              |                                                                                     | 10.7                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 79.0                                                                              |                                                                                   | 24.0                                                                              | 30.0                                                                              | 64.0                                                                              |                                                                                     | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.5                                                                               | 7.0                                                                               |                                                                                   | 4.3                                                                               | 9.0                                                                               | 8.2                                                                               |                                                                                     | 5.9                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 4.9                                                                               |                                                                                   | 0.5                                                                               | 0.8                                                                               | 4.3                                                                               |                                                                                     | 0.4                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 15.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 2: Hoohui Road

08/16/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)        | 55                                                                                | 20                                                                                | 200                                                                               | 40                                                                                | 15                                                                                | 5                                                                                 | 135                                                                               | 460                                                                               | 25                                                                                | 15                                                                                  | 495                                                                                 | 60                                                                                  |
| Future Volume (veh/h)         | 55                                                                                | 20                                                                                | 200                                                                               | 40                                                                                | 15                                                                                | 5                                                                                 | 135                                                                               | 460                                                                               | 25                                                                                | 15                                                                                  | 495                                                                                 | 60                                                                                  |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                 | 2                                                                                 | 12                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 0.98                                                                              |                                                                                   | 0.98                                                                              | 0.99                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 60                                                                                | 22                                                                                | 24                                                                                | 43                                                                                | 16                                                                                | 1                                                                                 | 147                                                                               | 500                                                                               | 0                                                                                 | 16                                                                                  | 538                                                                                 | 25                                                                                  |
| Adj No. of Lanes              | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 288                                                                               | 84                                                                                | 231                                                                               | 307                                                                               | 257                                                                               | 16                                                                                | 439                                                                               | 863                                                                               | 733                                                                               | 429                                                                                 | 731                                                                                 | 619                                                                                 |
| Arrive On Green               | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.15                                                                              | 0.08                                                                              | 0.46                                                                              | 0.00                                                                              | 0.01                                                                                | 0.39                                                                                | 0.39                                                                                |
| Sat Flow, veh/h               | 955                                                                               | 563                                                                               | 1557                                                                              | 1336                                                                              | 1733                                                                              | 108                                                                               | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1577                                                                                |
| Grp Volume(v), veh/h          | 82                                                                                | 0                                                                                 | 24                                                                                | 43                                                                                | 0                                                                                 | 17                                                                                | 147                                                                               | 500                                                                               | 0                                                                                 | 16                                                                                  | 538                                                                                 | 25                                                                                  |
| Grp Sat Flow(s),veh/h/ln      | 1518                                                                              | 0                                                                                 | 1557                                                                              | 1336                                                                              | 0                                                                                 | 1841                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1577                                                                                |
| Q Serve(g_s), s               | 1.2                                                                               | 0.0                                                                               | 0.6                                                                               | 1.3                                                                               | 0.0                                                                               | 0.3                                                                               | 2.0                                                                               | 8.4                                                                               | 0.0                                                                               | 0.2                                                                                 | 10.5                                                                                | 0.4                                                                                 |
| Cycle Q Clear(g_c), s         | 1.9                                                                               | 0.0                                                                               | 0.6                                                                               | 3.2                                                                               | 0.0                                                                               | 0.3                                                                               | 2.0                                                                               | 8.4                                                                               | 0.0                                                                               | 0.2                                                                                 | 10.5                                                                                | 0.4                                                                                 |
| Prop In Lane                  | 0.73                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 372                                                                               | 0                                                                                 | 231                                                                               | 307                                                                               | 0                                                                                 | 273                                                                               | 439                                                                               | 863                                                                               | 733                                                                               | 429                                                                                 | 731                                                                                 | 619                                                                                 |
| V/C Ratio(X)                  | 0.22                                                                              | 0.00                                                                              | 0.10                                                                              | 0.14                                                                              | 0.00                                                                              | 0.06                                                                              | 0.33                                                                              | 0.58                                                                              | 0.00                                                                              | 0.04                                                                                | 0.74                                                                                | 0.04                                                                                |
| Avail Cap(c_a), veh/h         | 1019                                                                              | 0                                                                                 | 915                                                                               | 894                                                                               | 0                                                                                 | 1082                                                                              | 918                                                                               | 2234                                                                              | 1899                                                                              | 1033                                                                                | 2234                                                                                | 1891                                                                                |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 16.2                                                                              | 0.0                                                                               | 15.7                                                                              | 17.7                                                                              | 0.0                                                                               | 15.6                                                                              | 7.9                                                                               | 8.4                                                                               | 0.0                                                                               | 8.0                                                                                 | 11.0                                                                                | 8.0                                                                                 |
| Incr Delay (d2), s/veh        | 0.3                                                                               | 0.0                                                                               | 0.2                                                                               | 0.2                                                                               | 0.0                                                                               | 0.1                                                                               | 0.4                                                                               | 0.6                                                                               | 0.0                                                                               | 0.0                                                                                 | 1.5                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 0.9                                                                               | 0.0                                                                               | 0.3                                                                               | 0.5                                                                               | 0.0                                                                               | 0.2                                                                               | 1.0                                                                               | 4.3                                                                               | 0.0                                                                               | 0.1                                                                                 | 5.7                                                                                 | 0.2                                                                                 |
| LnGrp Delay(d),s/veh          | 16.5                                                                              | 0.0                                                                               | 15.9                                                                              | 17.9                                                                              | 0.0                                                                               | 15.7                                                                              | 8.4                                                                               | 9.0                                                                               | 0.0                                                                               | 8.0                                                                                 | 12.5                                                                                | 8.0                                                                                 |
| LnGrp LOS                     | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                 |                                                                                   | B                                                                                 | A                                                                                 | A                                                                                 |                                                                                   | A                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h           |                                                                                   | 106                                                                               |                                                                                   |                                                                                   | 60                                                                                |                                                                                   |                                                                                   | 647                                                                               |                                                                                   |                                                                                     | 579                                                                                 |                                                                                     |
| Approach Delay, s/veh         |                                                                                   | 16.3                                                                              |                                                                                   |                                                                                   | 17.3                                                                              |                                                                                   |                                                                                   | 8.9                                                                               |                                                                                   |                                                                                     | 12.2                                                                                |                                                                                     |
| Approach LOS                  |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 5.5                                                                               | 25.7                                                                              |                                                                                   | 11.3                                                                              | 8.5                                                                               | 22.7                                                                              |                                                                                   | 11.3                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 15.0                                                                              | 51.0                                                                              |                                                                                   | 25.0                                                                              | 15.0                                                                              | 51.0                                                                              |                                                                                   | 25.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.2), s | 12.2                                                                              | 10.4                                                                              |                                                                                   | 3.9                                                                               | 4.0                                                                               | 12.5                                                                              |                                                                                   | 5.2                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.0                                                                               | 3.4                                                                               |                                                                                   | 0.4                                                                               | 0.3                                                                               | 3.9                                                                               |                                                                                   | 0.1                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           |                                                                                   |                                                                                   | 11.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 3: Honoapiilani Highway & Akahele Street

08/16/2017

|                               |  |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
|-------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|--|--|--|--|
| Movement                      | EBL                                                                                | EBT                                                                               | EBR  | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |  |  |  |  |  |  |  |
| Lane Configurations           |   |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)        | 40                                                                                 | 15                                                                                | 85   | 35                                                                                | 15                                                                                | 30                                                                                | 80                                                                                | 550                                                                                | 45                                                                                  | 25                                                                                  | 675                                                                                 | 50                                                                                  |  |  |  |  |  |  |  |
| Future Volume (veh/h)         | 40                                                                                 | 15                                                                                | 85   | 35                                                                                | 15                                                                                | 30                                                                                | 80                                                                                | 550                                                                                | 45                                                                                  | 25                                                                                  | 675                                                                                 | 50                                                                                  |  |  |  |  |  |  |  |
| Number                        | 7                                                                                  | 4                                                                                 | 14   | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                 | 2                                                                                  | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |  |  |  |  |  |  |  |
| Initial Q (Qb), veh           | 0                                                                                  | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |  |  |  |  |  |  |  |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                               |                                                                                   | 0.99 | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                    | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |  |  |  |  |  |  |  |
| Parking Bus, Adj              | 1.00                                                                               | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |  |  |  |  |  |  |  |
| Adj Sat Flow, veh/h/ln        | 1863                                                                               | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |  |  |  |  |  |  |  |
| Adj Flow Rate, veh/h          | 43                                                                                 | 16                                                                                | 4    | 38                                                                                | 16                                                                                | 1                                                                                 | 87                                                                                | 598                                                                                | 27                                                                                  | 27                                                                                  | 734                                                                                 | 26                                                                                  |  |  |  |  |  |  |  |
| Adj No. of Lanes              | 1                                                                                  | 1                                                                                 | 0    | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |  |  |  |  |  |  |  |
| Peak Hour Factor              | 0.92                                                                               | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |  |  |  |  |  |  |  |
| Percent Heavy Veh, %          | 2                                                                                  | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |  |  |  |  |  |  |  |
| Cap, veh/h                    | 59                                                                                 | 177                                                                               | 44   | 54                                                                                | 224                                                                               | 191                                                                               | 115                                                                               | 963                                                                                | 818                                                                                 | 32                                                                                  | 875                                                                                 | 743                                                                                 |  |  |  |  |  |  |  |
| Arrive On Green               | 0.03                                                                               | 0.12                                                                              | 0.12 | 0.03                                                                              | 0.12                                                                              | 0.12                                                                              | 0.06                                                                              | 0.52                                                                               | 0.52                                                                                | 0.02                                                                                | 0.47                                                                                | 0.47                                                                                |  |  |  |  |  |  |  |
| Sat Flow, veh/h               | 1774                                                                               | 1436                                                                              | 359  | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                              | 1863                                                                               | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1582                                                                                |  |  |  |  |  |  |  |
| Grp Volume(v), veh/h          | 43                                                                                 | 0                                                                                 | 20   | 38                                                                                | 16                                                                                | 1                                                                                 | 87                                                                                | 598                                                                                | 27                                                                                  | 27                                                                                  | 734                                                                                 | 26                                                                                  |  |  |  |  |  |  |  |
| Grp Sat Flow(s),veh/h/ln      | 1774                                                                               | 0                                                                                 | 1795 | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                              | 1863                                                                               | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1582                                                                                |  |  |  |  |  |  |  |
| Q Serve(g_s), s               | 1.5                                                                                | 0.0                                                                               | 0.6  | 1.4                                                                               | 0.5                                                                               | 0.0                                                                               | 3.1                                                                               | 14.7                                                                               | 0.5                                                                                 | 1.0                                                                                 | 22.1                                                                                | 0.6                                                                                 |  |  |  |  |  |  |  |
| Cycle Q Clear(g_c), s         | 1.5                                                                                | 0.0                                                                               | 0.6  | 1.4                                                                               | 0.5                                                                               | 0.0                                                                               | 3.1                                                                               | 14.7                                                                               | 0.5                                                                                 | 1.0                                                                                 | 22.1                                                                                | 0.6                                                                                 |  |  |  |  |  |  |  |
| Prop In Lane                  | 1.00                                                                               |                                                                                   | 0.20 | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                    | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |  |  |  |  |  |  |  |
| Lane Grp Cap(c), veh/h        | 59                                                                                 | 0                                                                                 | 221  | 54                                                                                | 224                                                                               | 191                                                                               | 115                                                                               | 963                                                                                | 818                                                                                 | 32                                                                                  | 875                                                                                 | 743                                                                                 |  |  |  |  |  |  |  |
| V/C Ratio(X)                  | 0.73                                                                               | 0.00                                                                              | 0.09 | 0.70                                                                              | 0.07                                                                              | 0.01                                                                              | 0.76                                                                              | 0.62                                                                               | 0.03                                                                                | 0.85                                                                                | 0.84                                                                                | 0.03                                                                                |  |  |  |  |  |  |  |
| Avail Cap(c_a), veh/h         | 553                                                                                | 0                                                                                 | 587  | 553                                                                               | 609                                                                               | 518                                                                               | 691                                                                               | 1886                                                                               | 1603                                                                                | 691                                                                                 | 1886                                                                                | 1601                                                                                |  |  |  |  |  |  |  |
| HCM Platoon Ratio             | 1.00                                                                               | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |  |  |  |  |  |  |  |
| Upstream Filter(I)            | 1.00                                                                               | 0.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |  |  |  |  |  |  |  |
| Uniform Delay (d), s/veh      | 30.7                                                                               | 0.0                                                                               | 25.0 | 30.8                                                                              | 25.1                                                                              | 24.9                                                                              | 29.5                                                                              | 11.0                                                                               | 7.6                                                                                 | 31.4                                                                                | 14.9                                                                                | 9.2                                                                                 |  |  |  |  |  |  |  |
| Incr Delay (d2), s/veh        | 15.5                                                                               | 0.0                                                                               | 0.2  | 14.9                                                                              | 0.1                                                                               | 0.0                                                                               | 9.7                                                                               | 0.7                                                                                | 0.0                                                                                 | 42.5                                                                                | 2.2                                                                                 | 0.0                                                                                 |  |  |  |  |  |  |  |
| Initial Q Delay(d3),s/veh     | 0.0                                                                                | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |  |  |  |  |  |  |  |
| %ile BackOfQ(50%),veh/ln      | 1.0                                                                                | 0.0                                                                               | 0.3  | 0.9                                                                               | 0.3                                                                               | 0.0                                                                               | 1.8                                                                               | 7.7                                                                                | 0.2                                                                                 | 0.8                                                                                 | 11.8                                                                                | 0.2                                                                                 |  |  |  |  |  |  |  |
| LnGrp Delay(d),s/veh          | 46.2                                                                               | 0.0                                                                               | 25.1 | 45.7                                                                              | 25.2                                                                              | 24.9                                                                              | 39.3                                                                              | 11.7                                                                               | 7.6                                                                                 | 73.9                                                                                | 17.1                                                                                | 9.2                                                                                 |  |  |  |  |  |  |  |
| LnGrp LOS                     | D                                                                                  |                                                                                   | C    | D                                                                                 | C                                                                                 | C                                                                                 | D                                                                                 | B                                                                                  | A                                                                                   | E                                                                                   | B                                                                                   | A                                                                                   |  |  |  |  |  |  |  |
| Approach Vol, veh/h           | 63                                                                                 |                                                                                   |      | 55                                                                                |                                                                                   |                                                                                   | 712                                                                               |                                                                                    |                                                                                     | 787                                                                                 |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Approach Delay, s/veh         | 39.5                                                                               |                                                                                   |      | 39.4                                                                              |                                                                                   |                                                                                   | 14.9                                                                              |                                                                                    |                                                                                     | 18.8                                                                                |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Approach LOS                  | D                                                                                  |                                                                                   |      | D                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                    |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Timer                         | 1                                                                                  | 2                                                                                 | 3    | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Assigned Phs                  | 1                                                                                  | 2                                                                                 | 3    | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Phs Duration (G+Y+Rc), s      | 6.2                                                                                | 38.2                                                                              | 7.0  | 12.9                                                                              | 9.2                                                                               | 35.2                                                                              | 7.1                                                                               | 12.7                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Change Period (Y+Rc), s       | 5.0                                                                                | 5.0                                                                               | 5.0  | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Max Green Setting (Gmax), s   | 25.0                                                                               | 65.0                                                                              | 20.0 | 21.0                                                                              | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Max Q Clear Time (g_c+1.0), s | 13.0                                                                               | 16.7                                                                              | 3.4  | 2.6                                                                               | 5.1                                                                               | 24.1                                                                              | 3.5                                                                               | 2.5                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Green Ext Time (p_c), s       | 0.0                                                                                | 4.5                                                                               | 0.0  | 0.0                                                                               | 0.2                                                                               | 6.0                                                                               | 0.1                                                                               | 0.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| Intersection Summary          |                                                                                    |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| HCM 2010 Ctrl Delay           | 18.6                                                                               |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |
| HCM 2010 LOS                  | B                                                                                  |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |

# HCM 2010 Signalized Intersection Summary

## 4: Honoapiilani Highway & Lower Honoapiilani Road

08/16/2017

|                              |  |      |      |      |      |      |      |      |      |      |      |      |  |  |  |  |  |  |  |
|------------------------------|------------------------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|--|--|--|--|--|--|--|
| Movement                     | EBL                                                                                | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |  |  |  |  |  |  |  |
| Lane Configurations          |                                                                                    | ↩    | ↩    |      | ↩    |      | ↩    | ↩    |      | ↩    | ↩    | ↩    |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 55                                                                                 | 10   | 595  | 10   | 0    | 5    | 410  | 625  | 5    | 0    | 750  | 55   |  |  |  |  |  |  |  |
| Future Volume (veh/h)        | 55                                                                                 | 10   | 595  | 10   | 0    | 5    | 410  | 625  | 5    | 0    | 750  | 55   |  |  |  |  |  |  |  |
| Number                       | 3                                                                                  | 8    | 18   | 7    | 4    | 14   | 1    | 6    | 16   | 5    | 2    | 12   |  |  |  |  |  |  |  |
| Initial Q (Qb), veh          | 0                                                                                  | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |  |  |  |  |  |  |  |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                               |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 |  |  |  |  |  |  |  |
| Parking Bus, Adj             | 1.00                                                                               | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  |  |  |  |  |  |  |
| Adj Sat Flow, veh/h/ln       | 1900                                                                               | 1863 | 1863 | 1900 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 |  |  |  |  |  |  |  |
| Adj Flow Rate, veh/h         | 60                                                                                 | 11   | 0    | 11   | 0    | 1    | 446  | 679  | 5    | 0    | 815  | 19   |  |  |  |  |  |  |  |
| Adj No. of Lanes             | 0                                                                                  | 1    | 1    | 0    | 1    | 0    | 1    | 2    | 0    | 1    | 2    | 1    |  |  |  |  |  |  |  |
| Peak Hour Factor             | 0.92                                                                               | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |  |  |  |  |  |  |  |
| Percent Heavy Veh, %         | 2                                                                                  | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |  |  |  |  |  |  |  |
| Cap, veh/h                   | 192                                                                                | 15   | 100  | 207  | 4    | 9    | 515  | 2700 | 20   | 3    | 1386 | 618  |  |  |  |  |  |  |  |
| Arrive On Green              | 0.08                                                                               | 0.06 | 0.00 | 0.08 | 0.00 | 0.06 | 0.29 | 0.75 | 0.75 | 0.00 | 0.39 | 0.39 |  |  |  |  |  |  |  |
| Sat Flow, veh/h              | 1255                                                                               | 230  | 1583 | 1424 | 65   | 135  | 1774 | 3601 | 27   | 1774 | 3539 | 1577 |  |  |  |  |  |  |  |
| Grp Volume(v), veh/h         | 71                                                                                 | 0    | 0    | 12   | 0    | 0    | 446  | 334  | 350  | 0    | 815  | 19   |  |  |  |  |  |  |  |
| Grp Sat Flow(s), veh/h/ln    | 1486                                                                               | 0    | 1583 | 1624 | 0    | 0    | 1774 | 1770 | 1858 | 1774 | 1770 | 1577 |  |  |  |  |  |  |  |
| Q Serve(g_s), s              | 2.3                                                                                | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 14.0 | 3.4  | 3.4  | 0.0  | 10.7 | 0.4  |  |  |  |  |  |  |  |
| Cycle Q Clear(g_c), s        | 2.7                                                                                | 0.0  | 0.0  | 0.4  | 0.0  | 0.0  | 14.0 | 3.4  | 3.4  | 0.0  | 10.7 | 0.4  |  |  |  |  |  |  |  |
| Prop In Lane                 | 0.85                                                                               |      | 1.00 | 0.92 |      | 0.08 | 1.00 |      | 0.01 | 1.00 |      | 1.00 |  |  |  |  |  |  |  |
| Lane Grp Cap(c), veh/h       | 232                                                                                | 0    | 100  | 248  | 0    | 0    | 515  | 1327 | 1393 | 3    | 1386 | 618  |  |  |  |  |  |  |  |
| V/C Ratio(X)                 | 0.31                                                                               | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 | 0.87 | 0.25 | 0.25 | 0.00 | 0.59 | 0.03 |  |  |  |  |  |  |  |
| Avail Cap(c_a), veh/h        | 886                                                                                | 0    | 808  | 807  | 0    | 0    | 2143 | 1716 | 1802 | 2143 | 3432 | 1530 |  |  |  |  |  |  |  |
| HCM Platoon Ratio            | 1.00                                                                               | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  |  |  |  |  |  |  |
| Upstream Filter(I)           | 1.00                                                                               | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 |  |  |  |  |  |  |  |
| Uniform Delay (d), s/veh     | 26.6                                                                               | 0.0  | 0.0  | 25.5 | 0.0  | 0.0  | 19.8 | 2.3  | 2.3  | 0.0  | 14.1 | 11.0 |  |  |  |  |  |  |  |
| Incr Delay (d2), s/veh       | 0.7                                                                                | 0.0  | 0.0  | 0.1  | 0.0  | 0.0  | 1.8  | 0.2  | 0.2  | 0.0  | 0.9  | 0.0  |  |  |  |  |  |  |  |
| Initial Q Delay(d3),s/veh    | 0.0                                                                                | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |  |  |  |  |  |  |  |
| %ile BackOfQ(50%),veh/ln     | 1.1                                                                                | 0.0  | 0.0  | 0.2  | 0.0  | 0.0  | 7.1  | 1.7  | 1.8  | 0.0  | 5.4  | 0.2  |  |  |  |  |  |  |  |
| LnGrp Delay(d),s/veh         | 27.3                                                                               | 0.0  | 0.0  | 25.6 | 0.0  | 0.0  | 21.6 | 2.5  | 2.5  | 0.0  | 15.0 | 11.1 |  |  |  |  |  |  |  |
| LnGrp LOS                    | C                                                                                  |      |      | C    |      |      | C    | A    | A    |      | B    | B    |  |  |  |  |  |  |  |
| Approach Vol, veh/h          | 71                                                                                 |      |      | 12   |      |      | 1130 |      |      | 834  |      |      |  |  |  |  |  |  |  |
| Approach Delay, s/veh        | 27.3                                                                               |      |      | 25.6 |      |      | 10.0 |      |      | 14.9 |      |      |  |  |  |  |  |  |  |
| Approach LOS                 | C                                                                                  |      |      | C    |      |      | B    |      |      | B    |      |      |  |  |  |  |  |  |  |
| Timer                        | 1                                                                                  | 2    | 3    | 4    | 5    | 6    | 7    | 8    |      |      |      |      |  |  |  |  |  |  |  |
| Assigned Phs                 | 1                                                                                  | 2    |      | 4    | 5    | 6    |      | 8    |      |      |      |      |  |  |  |  |  |  |  |
| Phs Duration (G+Y+Rc), s     | 21.0                                                                               | 29.0 |      | 8.7  | 0.0  | 50.1 |      | 8.7  |      |      |      |      |  |  |  |  |  |  |  |
| Change Period (Y+Rc), s      | 4.0                                                                                | 6.0  |      | 5.0  | 4.0  | 6.0  |      | 5.0  |      |      |      |      |  |  |  |  |  |  |  |
| Max Green Setting (Gmax), s  | 71.0                                                                               | 57.0 |      | 27.0 | 71.0 | 57.0 |      | 30.0 |      |      |      |      |  |  |  |  |  |  |  |
| Max Q Clear Time (g_c+10), s | 12.7                                                                               | 10.3 |      | 2.4  | 0.0  | 5.4  |      | 4.7  |      |      |      |      |  |  |  |  |  |  |  |
| Green Ext Time (p_c), s      | 1.0                                                                                | 10.3 |      | 0.0  | 0.0  | 7.3  |      | 0.2  |      |      |      |      |  |  |  |  |  |  |  |
| Intersection Summary         |                                                                                    |      |      |      |      |      |      |      |      |      |      |      |  |  |  |  |  |  |  |
| HCM 2010 Ctrl Delay          | 12.7                                                                               |      |      |      |      |      |      |      |      |      |      |      |  |  |  |  |  |  |  |
| HCM 2010 LOS                 | B                                                                                  |      |      |      |      |      |      |      |      |      |      |      |  |  |  |  |  |  |  |

# HCM 2010 Signalized Intersection Summary

## 5: Honoapiilani Highway & Halawai Drive

08/16/2017

| Movement                     | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |  |  |  |  |  |  |  |
|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|--|--|--|--|--|--|--|
| Lane Configurations          |      | ↰    | ↱    |      | ↰    | ↱    | ↰    | ↱    |      | ↰    | ↱    | ↱    |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 60   | 5    | 145  | 15   | 5    | 15   | 105  | 980  | 20   | 10   | 1315 | 65   |  |  |  |  |  |  |  |
| Future Volume (veh/h)        | 60   | 5    | 145  | 15   | 5    | 15   | 105  | 980  | 20   | 10   | 1315 | 65   |  |  |  |  |  |  |  |
| Number                       | 3    | 8    | 18   | 7    | 4    | 14   | 1    | 6    | 16   | 5    | 2    | 12   |  |  |  |  |  |  |  |
| Initial Q (Qb), veh          | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |  |  |  |  |  |  |  |
| Ped-Bike Adj(A_pbT)          | 0.98 |      | 0.98 | 0.98 |      | 0.98 | 1.00 |      | 1.00 | 1.00 |      | 1.00 |  |  |  |  |  |  |  |
| Parking Bus, Adj             | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  |  |  |  |  |  |  |
| Adj Sat Flow, veh/h/ln       | 1900 | 1863 | 1863 | 1900 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 |  |  |  |  |  |  |  |
| Adj Flow Rate, veh/h         | 65   | 5    | 7    | 16   | 5    | 1    | 114  | 1065 | 21   | 11   | 1429 | 42   |  |  |  |  |  |  |  |
| Adj No. of Lanes             | 0    | 1    | 1    | 0    | 1    | 0    | 1    | 2    | 0    | 1    | 2    | 1    |  |  |  |  |  |  |  |
| Peak Hour Factor             | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |  |  |  |  |  |  |  |
| Percent Heavy Veh, %         | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |  |  |  |  |  |  |  |
| Cap, veh/h                   | 224  | 13   | 143  | 150  | 36   | 5    | 146  | 2508 | 49   | 15   | 2238 | 999  |  |  |  |  |  |  |  |
| Arrive On Green              | 0.11 | 0.09 | 0.09 | 0.11 | 0.09 | 0.09 | 0.08 | 0.71 | 0.71 | 0.01 | 0.63 | 0.63 |  |  |  |  |  |  |  |
| Sat Flow, veh/h              | 1390 | 144  | 1547 | 695  | 388  | 52   | 1774 | 3550 | 70   | 1774 | 3539 | 1580 |  |  |  |  |  |  |  |
| Grp Volume(v), veh/h         | 70   | 0    | 7    | 22   | 0    | 0    | 114  | 531  | 555  | 11   | 1429 | 42   |  |  |  |  |  |  |  |
| Grp Sat Flow(s),veh/h/ln     | 1534 | 0    | 1547 | 1134 | 0    | 0    | 1774 | 1770 | 1850 | 1774 | 1770 | 1580 |  |  |  |  |  |  |  |
| Q Serve(g_s), s              | 0.0  | 0.0  | 0.3  | 0.1  | 0.0  | 0.0  | 4.6  | 9.1  | 9.1  | 0.4  | 18.1 | 0.7  |  |  |  |  |  |  |  |
| Cycle Q Clear(g_c), s        | 2.7  | 0.0  | 0.3  | 2.8  | 0.0  | 0.0  | 4.6  | 9.1  | 9.1  | 0.4  | 18.1 | 0.7  |  |  |  |  |  |  |  |
| Prop In Lane                 | 0.93 |      | 1.00 | 0.73 |      | 0.05 | 1.00 |      | 0.04 | 1.00 |      | 1.00 |  |  |  |  |  |  |  |
| Lane Grp Cap(c), veh/h       | 258  | 0    | 143  | 206  | 0    | 0    | 146  | 1250 | 1307 | 15   | 2238 | 999  |  |  |  |  |  |  |  |
| V/C Ratio(X)                 | 0.27 | 0.00 | 0.05 | 0.11 | 0.00 | 0.00 | 0.78 | 0.42 | 0.42 | 0.75 | 0.64 | 0.04 |  |  |  |  |  |  |  |
| Avail Cap(c_a), veh/h        | 575  | 0    | 491  | 536  | 0    | 0    | 514  | 2099 | 2194 | 269  | 3709 | 1655 |  |  |  |  |  |  |  |
| HCM Platoon Ratio            | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  |  |  |  |  |  |  |
| Upstream Filter(I)           | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  |  |  |  |  |  |  |
| Uniform Delay (d), s/veh     | 30.7 | 0.0  | 30.0 | 30.0 | 0.0  | 0.0  | 32.6 | 4.5  | 4.5  | 35.9 | 8.2  | 5.0  |  |  |  |  |  |  |  |
| Incr Delay (d2), s/veh       | 0.2  | 0.0  | 0.1  | 0.1  | 0.0  | 0.0  | 3.4  | 0.5  | 0.5  | 24.7 | 0.7  | 0.0  |  |  |  |  |  |  |  |
| Initial Q Delay(d3),s/veh    | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |  |  |  |  |  |  |  |
| %ile BackOfQ(50%),veh/ln     | 1.3  | 0.0  | 0.1  | 0.4  | 0.0  | 0.0  | 2.4  | 4.4  | 4.8  | 0.3  | 8.9  | 0.3  |  |  |  |  |  |  |  |
| LnGrp Delay(d),s/veh         | 30.9 | 0.0  | 30.1 | 30.1 | 0.0  | 0.0  | 36.0 | 5.0  | 4.9  | 60.6 | 8.9  | 5.1  |  |  |  |  |  |  |  |
| LnGrp LOS                    | C    |      | C    | C    |      |      | D    | A    | A    | E    | A    | A    |  |  |  |  |  |  |  |
| Approach Vol, veh/h          | 77   |      |      | 22   |      |      | 1200 |      |      | 1482 |      |      |  |  |  |  |  |  |  |
| Approach Delay, s/veh        | 30.8 |      |      | 30.1 |      |      | 7.9  |      |      | 9.1  |      |      |  |  |  |  |  |  |  |
| Approach LOS                 | C    |      |      | C    |      |      | A    |      |      | A    |      |      |  |  |  |  |  |  |  |
| Timer                        | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    |      |      |      |      |  |  |  |  |  |  |  |
| Assigned Phs                 | 1    | 2    |      | 4    | 5    | 6    |      | 8    |      |      |      |      |  |  |  |  |  |  |  |
| Phs Duration (G+Y+Rc), s     | 10.0 | 50.9 |      | 11.7 | 4.6  | 56.2 |      | 11.7 |      |      |      |      |  |  |  |  |  |  |  |
| Change Period (Y+Rc), s      | 4.0  | 5.0  |      | 5.0  | 4.0  | 5.0  |      | 5.0  |      |      |      |      |  |  |  |  |  |  |  |
| Max Green Setting (Gmax), s  | 21.0 | 76.0 |      | 23.0 | 11.0 | 86.0 |      | 23.0 |      |      |      |      |  |  |  |  |  |  |  |
| Max Q Clear Time (g_c+10), s | 10.6 | 20.1 |      | 4.8  | 2.4  | 11.1 |      | 4.7  |      |      |      |      |  |  |  |  |  |  |  |
| Green Ext Time (p_c), s      | 0.1  | 25.8 |      | 0.0  | 0.0  | 15.2 |      | 0.1  |      |      |      |      |  |  |  |  |  |  |  |
| <b>Intersection Summary</b>  |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |  |  |  |  |
| HCM 2010 Ctrl Delay          | 9.4  |      |      |      |      |      |      |      |      |      |      |      |  |  |  |  |  |  |  |
| HCM 2010 LOS                 | A    |      |      |      |      |      |      |      |      |      |      |      |  |  |  |  |  |  |  |

# HCM 2010 Signalized Intersection Summary

## 6: Honoapiilani Highway & Kai Ala Drive/Puukolii Road

08/16/2017

|                             |  |      |      |      |      |      |      |      |      |      |      |      |  |  |  |  |  |  |  |
|-----------------------------|------------------------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|--|--|--|--|--|--|--|
| Movement                    | EBL                                                                                | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |  |  |  |  |  |  |  |
| Lane Configurations         |                                                                                    | ↩    | ↩    | ↩    | ↩    |      | ↩    | ↩↩   | ↩    | ↩    | ↩↩   | ↩    |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)      | 65                                                                                 | 5    | 180  | 45   | 5    | 35   | 110  | 1050 | 50   | 30   | 1390 | 75   |  |  |  |  |  |  |  |
| Future Volume (veh/h)       | 65                                                                                 | 5    | 180  | 45   | 5    | 35   | 110  | 1050 | 50   | 30   | 1390 | 75   |  |  |  |  |  |  |  |
| Number                      | 3                                                                                  | 8    | 18   | 7    | 4    | 14   | 1    | 6    | 16   | 5    | 2    | 12   |  |  |  |  |  |  |  |
| Initial Q (Qb), veh         | 0                                                                                  | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |  |  |  |  |  |  |  |
| Ped-Bike Adj(A_pbT)         | 1.00                                                                               |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 |  |  |  |  |  |  |  |
| Parking Bus, Adj            | 1.00                                                                               | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  |  |  |  |  |  |  |
| Adj Sat Flow, veh/h/ln      | 1900                                                                               | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |  |  |  |  |  |  |  |
| Adj Flow Rate, veh/h        | 71                                                                                 | 5    | 12   | 49   | 5    | 2    | 120  | 1141 | 33   | 33   | 1511 | 45   |  |  |  |  |  |  |  |
| Adj No. of Lanes            | 0                                                                                  | 1    | 1    | 1    | 1    | 0    | 1    | 2    | 1    | 1    | 2    | 1    |  |  |  |  |  |  |  |
| Peak Hour Factor            | 0.92                                                                               | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |  |  |  |  |  |  |  |
| Percent Heavy Veh, %        | 2                                                                                  | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |  |  |  |  |  |  |  |
| Cap, veh/h                  | 275                                                                                | 16   | 232  | 223  | 186  | 74   | 154  | 2262 | 1012 | 57   | 2069 | 926  |  |  |  |  |  |  |  |
| Arrive On Green             | 0.16                                                                               | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.09 | 0.64 | 0.64 | 0.03 | 0.58 | 0.58 |  |  |  |  |  |  |  |
| Sat Flow, veh/h             | 1299                                                                               | 111  | 1577 | 1386 | 1265 | 506  | 1774 | 3539 | 1583 | 1774 | 3539 | 1583 |  |  |  |  |  |  |  |
| Grp Volume(v), veh/h        | 76                                                                                 | 0    | 12   | 49   | 0    | 7    | 120  | 1141 | 33   | 33   | 1511 | 45   |  |  |  |  |  |  |  |
| Grp Sat Flow(s),veh/h/ln    | 1411                                                                               | 0    | 1577 | 1386 | 0    | 1771 | 1774 | 1770 | 1583 | 1774 | 1770 | 1583 |  |  |  |  |  |  |  |
| Q Serve(g_s), s             | 3.7                                                                                | 0.0  | 0.5  | 2.7  | 0.0  | 0.3  | 5.5  | 14.2 | 0.6  | 1.5  | 25.5 | 1.0  |  |  |  |  |  |  |  |
| Cycle Q Clear(g_c), s       | 4.0                                                                                | 0.0  | 0.5  | 6.7  | 0.0  | 0.3  | 5.5  | 14.2 | 0.6  | 1.5  | 25.5 | 1.0  |  |  |  |  |  |  |  |
| Prop In Lane                | 0.93                                                                               |      | 1.00 | 1.00 |      | 0.29 | 1.00 |      | 1.00 | 1.00 |      | 1.00 |  |  |  |  |  |  |  |
| Lane Grp Cap(c), veh/h      | 309                                                                                | 0    | 232  | 223  | 0    | 260  | 154  | 2262 | 1012 | 57   | 2069 | 926  |  |  |  |  |  |  |  |
| V/C Ratio(X)                | 0.25                                                                               | 0.00 | 0.05 | 0.22 | 0.00 | 0.03 | 0.78 | 0.50 | 0.03 | 0.58 | 0.73 | 0.05 |  |  |  |  |  |  |  |
| Avail Cap(c_a), veh/h       | 513                                                                                | 0    | 459  | 423  | 0    | 515  | 452  | 2960 | 1324 | 258  | 2574 | 1152 |  |  |  |  |  |  |  |
| HCM Platoon Ratio           | 1.00                                                                               | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  |  |  |  |  |  |  |
| Upstream Filter(I)          | 1.00                                                                               | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  |  |  |  |  |  |  |
| Uniform Delay (d), s/veh    | 31.3                                                                               | 0.0  | 30.2 | 34.8 | 0.0  | 30.1 | 36.9 | 7.9  | 5.5  | 39.4 | 12.4 | 7.3  |  |  |  |  |  |  |  |
| Incr Delay (d2), s/veh      | 0.4                                                                                | 0.0  | 0.1  | 0.5  | 0.0  | 0.0  | 3.2  | 0.4  | 0.0  | 3.4  | 1.3  | 0.0  |  |  |  |  |  |  |  |
| Initial Q Delay(d3),s/veh   | 0.0                                                                                | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |  |  |  |  |  |  |  |
| %ile BackOfQ(50%),veh/ln    | 1.6                                                                                | 0.0  | 0.2  | 1.1  | 0.0  | 0.1  | 2.8  | 6.9  | 0.3  | 0.8  | 12.8 | 0.4  |  |  |  |  |  |  |  |
| LnGrp Delay(d),s/veh        | 31.8                                                                               | 0.0  | 30.3 | 35.3 | 0.0  | 30.2 | 40.2 | 8.3  | 5.5  | 42.8 | 13.7 | 7.4  |  |  |  |  |  |  |  |
| LnGrp LOS                   | C                                                                                  |      | C    | D    |      | C    | D    | A    | A    | D    | B    | A    |  |  |  |  |  |  |  |
| Approach Vol, veh/h         | 88                                                                                 |      |      | 56   |      |      | 1294 |      |      | 1589 |      |      |  |  |  |  |  |  |  |
| Approach Delay, s/veh       | 31.6                                                                               |      |      | 34.6 |      |      | 11.2 |      |      | 14.1 |      |      |  |  |  |  |  |  |  |
| Approach LOS                | C                                                                                  |      |      | C    |      |      | B    |      |      | B    |      |      |  |  |  |  |  |  |  |
| Timer                       | 1                                                                                  | 2    | 3    | 4    | 5    | 6    | 7    | 8    |      |      |      |      |  |  |  |  |  |  |  |
| Assigned Phs                | 1                                                                                  | 2    |      | 4    | 5    | 6    |      | 8    |      |      |      |      |  |  |  |  |  |  |  |
| Phs Duration (G+Y+Rc), s    | 11.1                                                                               | 54.2 |      | 17.1 | 6.7  | 58.7 |      | 17.1 |      |      |      |      |  |  |  |  |  |  |  |
| Change Period (Y+Rc), s     | 4.0                                                                                | 6.0  |      | 5.0  | 4.0  | 6.0  |      | 5.0  |      |      |      |      |  |  |  |  |  |  |  |
| Max Green Setting (Gmax), s | 21.0                                                                               | 60.0 |      | 24.0 | 12.0 | 69.0 |      | 24.0 |      |      |      |      |  |  |  |  |  |  |  |
| Max Q Clear Time (g_c+1), s | 17.5                                                                               | 27.5 |      | 8.7  | 3.5  | 16.2 |      | 6.0  |      |      |      |      |  |  |  |  |  |  |  |
| Green Ext Time (p_c), s     | 0.2                                                                                | 20.7 |      | 0.1  | 0.0  | 17.6 |      | 0.2  |      |      |      |      |  |  |  |  |  |  |  |
| Intersection Summary        |                                                                                    |      |      |      |      |      |      |      |      |      |      |      |  |  |  |  |  |  |  |
| HCM 2010 Ctrl Delay         | 13.8                                                                               |      |      |      |      |      |      |      |      |      |      |      |  |  |  |  |  |  |  |
| HCM 2010 LOS                | B                                                                                  |      |      |      |      |      |      |      |      |      |      |      |  |  |  |  |  |  |  |



# HCM 2010 Signalized Intersection Summary

## 7: Honoapiilani Highway & Kaanapali Parkway/Halelo Street

08/16/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)        | 240                                                                               | 5                                                                                 | 445                                                                               | 15                                                                                | 5                                                                                 | 20                                                                                | 290                                                                               | 1170                                                                              | 15                                                                                | 55                                                                                  | 1395                                                                                | 155                                                                                 |
| Future Volume (veh/h)         | 240                                                                               | 5                                                                                 | 445                                                                               | 15                                                                                | 5                                                                                 | 20                                                                                | 290                                                                               | 1170                                                                              | 15                                                                                | 55                                                                                  | 1395                                                                                | 155                                                                                 |
| Number                        | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 265                                                                               | 0                                                                                 | 268                                                                               | 16                                                                                | 5                                                                                 | 7                                                                                 | 315                                                                               | 1272                                                                              | 16                                                                                | 60                                                                                  | 1516                                                                                | 134                                                                                 |
| Adj No. of Lanes              | 2                                                                                 | 0                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 2                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 448                                                                               | 0                                                                                 | 780                                                                               | 50                                                                                | 16                                                                                | 22                                                                                | 442                                                                               | 2227                                                                              | 28                                                                                | 118                                                                                 | 1983                                                                                | 1073                                                                                |
| Arrive On Green               | 0.13                                                                              | 0.00                                                                              | 0.12                                                                              | 0.05                                                                              | 0.05                                                                              | 0.03                                                                              | 0.13                                                                              | 0.62                                                                              | 0.61                                                                              | 0.07                                                                                | 0.56                                                                                | 0.56                                                                                |
| Sat Flow, veh/h               | 3548                                                                              | 0                                                                                 | 3167                                                                              | 992                                                                               | 310                                                                               | 434                                                                               | 3442                                                                              | 3579                                                                              | 45                                                                                | 1774                                                                                | 3539                                                                                | 1582                                                                                |
| Grp Volume(v), veh/h          | 265                                                                               | 0                                                                                 | 268                                                                               | 28                                                                                | 0                                                                                 | 0                                                                                 | 315                                                                               | 629                                                                               | 659                                                                               | 60                                                                                  | 1516                                                                                | 134                                                                                 |
| Grp Sat Flow(s),veh/h/ln      | 1774                                                                              | 0                                                                                 | 1583                                                                              | 1737                                                                              | 0                                                                                 | 0                                                                                 | 1721                                                                              | 1770                                                                              | 1855                                                                              | 1774                                                                                | 1770                                                                                | 1582                                                                                |
| Q Serve(g_s), s               | 8.4                                                                               | 0.0                                                                               | 8.3                                                                               | 1.9                                                                               | 0.0                                                                               | 0.0                                                                               | 10.5                                                                              | 24.8                                                                              | 24.8                                                                              | 3.9                                                                                 | 39.2                                                                                | 3.5                                                                                 |
| Cycle Q Clear(g_c), s         | 8.4                                                                               | 0.0                                                                               | 8.3                                                                               | 1.9                                                                               | 0.0                                                                               | 0.0                                                                               | 10.5                                                                              | 24.8                                                                              | 24.8                                                                              | 3.9                                                                                 | 39.2                                                                                | 3.5                                                                                 |
| Prop In Lane                  | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.57                                                                              |                                                                                   | 0.25                                                                              | 1.00                                                                              |                                                                                   | 0.02                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 448                                                                               | 0                                                                                 | 780                                                                               | 88                                                                                | 0                                                                                 | 0                                                                                 | 442                                                                               | 1101                                                                              | 1154                                                                              | 118                                                                                 | 1983                                                                                | 1073                                                                                |
| V/C Ratio(X)                  | 0.59                                                                              | 0.00                                                                              | 0.34                                                                              | 0.32                                                                              | 0.00                                                                              | 0.00                                                                              | 0.71                                                                              | 0.57                                                                              | 0.57                                                                              | 0.51                                                                                | 0.76                                                                                | 0.12                                                                                |
| Avail Cap(c_a), veh/h         | 1013                                                                              | 0                                                                                 | 1285                                                                              | 452                                                                               | 0                                                                                 | 0                                                                                 | 1676                                                                              | 2882                                                                              | 3021                                                                              | 223                                                                                 | 4487                                                                                | 2193                                                                                |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 49.1                                                                              | 0.0                                                                               | 36.9                                                                              | 54.9                                                                              | 0.0                                                                               | 0.0                                                                               | 49.8                                                                              | 13.2                                                                              | 13.2                                                                              | 53.7                                                                                | 20.1                                                                                | 6.7                                                                                 |
| Incr Delay (d2), s/veh        | 0.5                                                                               | 0.0                                                                               | 0.1                                                                               | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 0.8                                                                               | 0.7                                                                               | 0.6                                                                               | 1.3                                                                                 | 0.9                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 4.2                                                                               | 0.0                                                                               | 3.6                                                                               | 0.9                                                                               | 0.0                                                                               | 0.0                                                                               | 5.0                                                                               | 12.3                                                                              | 12.8                                                                              | 2.0                                                                                 | 19.2                                                                                | 2.1                                                                                 |
| LnGrp Delay(d),s/veh          | 49.6                                                                              | 0.0                                                                               | 37.0                                                                              | 55.7                                                                              | 0.0                                                                               | 0.0                                                                               | 50.6                                                                              | 13.8                                                                              | 13.8                                                                              | 55.0                                                                                | 21.0                                                                                | 6.8                                                                                 |
| LnGrp LOS                     | D                                                                                 |                                                                                   | D                                                                                 | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 | B                                                                                 | B                                                                                 | D                                                                                   | C                                                                                   | A                                                                                   |
| Approach Vol, veh/h           | 533                                                                               |                                                                                   | 28                                                                                |                                                                                   |                                                                                   |                                                                                   | 1603                                                                              |                                                                                   |                                                                                   | 1710                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 43.3                                                                              |                                                                                   | 55.7                                                                              |                                                                                   |                                                                                   |                                                                                   | 21.1                                                                              |                                                                                   |                                                                                   | 21.1                                                                                |                                                                                     |                                                                                     |
| Approach LOS                  | D                                                                                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                   |                                                                                     |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 19.3                                                                              | 70.7                                                                              |                                                                                   | 10.0                                                                              | 11.9                                                                              | 78.1                                                                              |                                                                                   | 19.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 6.0                                                                               | 6.0                                                                               |                                                                                   | 7.0                                                                               | 6.0                                                                               | 6.0                                                                               |                                                                                   | 7.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 50.0                                                                              | 149.0                                                                             |                                                                                   | 28.0                                                                              | 13.0                                                                              | 192.0                                                                             |                                                                                   | 31.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.2), s | 12.5                                                                              | 41.2                                                                              |                                                                                   | 3.9                                                                               | 5.9                                                                               | 26.8                                                                              |                                                                                   | 10.4                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.9                                                                               | 23.5                                                                              |                                                                                   | 0.0                                                                               | 0.0                                                                               | 13.0                                                                              |                                                                                   | 1.6                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           |                                                                                   |                                                                                   | 24.4                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 8: Honoapiilani Highway & Leialii Parkway

08/16/2017

|                               |  |      |      |      |      |      |      |      |      |      |      |      |  |  |  |  |  |  |  |
|-------------------------------|------------------------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|--|--|--|--|--|--|--|
| Movement                      | EBL                                                                                | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |  |  |  |  |  |  |  |
| Lane Configurations           |                                                                                    | ↔    |      | ↔    | ↔    |      | ↔    | ↔    |      | ↔    | ↔    |      |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)        | 5                                                                                  | 0    | 5    | 135  | 5    | 60   | 5    | 1345 | 90   | 90   | 1825 | 10   |  |  |  |  |  |  |  |
| Future Volume (veh/h)         | 5                                                                                  | 0    | 5    | 135  | 5    | 60   | 5    | 1345 | 90   | 90   | 1825 | 10   |  |  |  |  |  |  |  |
| Number                        | 3                                                                                  | 8    | 18   | 7    | 4    | 14   | 1    | 6    | 16   | 5    | 2    | 12   |  |  |  |  |  |  |  |
| Initial Q (Qb), veh           | 0                                                                                  | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |  |  |  |  |  |  |  |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                               |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 |  |  |  |  |  |  |  |
| Parking Bus, Adj              | 1.00                                                                               | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  |  |  |  |  |  |  |
| Adj Sat Flow, veh/h/ln        | 1900                                                                               | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |  |  |  |  |  |  |  |
| Adj Flow Rate, veh/h          | 5                                                                                  | 0    | 1    | 147  | 5    | 5    | 5    | 1462 | 95   | 98   | 1984 | 11   |  |  |  |  |  |  |  |
| Adj No. of Lanes              | 0                                                                                  | 1    | 0    | 1    | 1    | 0    | 1    | 2    | 0    | 1    | 2    | 0    |  |  |  |  |  |  |  |
| Peak Hour Factor              | 0.92                                                                               | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |  |  |  |  |  |  |  |
| Percent Heavy Veh, %          | 2                                                                                  | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |  |  |  |  |  |  |  |
| Cap, veh/h                    | 194                                                                                | 5    | 30   | 234  | 107  | 107  | 11   | 2404 | 156  | 124  | 2800 | 16   |  |  |  |  |  |  |  |
| Arrive On Green               | 0.13                                                                               | 0.00 | 0.12 | 0.13 | 0.13 | 0.12 | 0.01 | 0.95 | 0.94 | 0.07 | 0.78 | 0.77 |  |  |  |  |  |  |  |
| Sat Flow, veh/h               | 1140                                                                               | 37   | 235  | 1410 | 856  | 856  | 1774 | 3375 | 218  | 1774 | 3609 | 20   |  |  |  |  |  |  |  |
| Grp Volume(v), veh/h          | 6                                                                                  | 0    | 0    | 147  | 0    | 10   | 5    | 764  | 793  | 98   | 972  | 1023 |  |  |  |  |  |  |  |
| Grp Sat Flow(s),veh/h/ln      | 1412                                                                               | 0    | 0    | 1410 | 0    | 1712 | 1774 | 1770 | 1824 | 1774 | 1770 | 1859 |  |  |  |  |  |  |  |
| Q Serve(g_s), s               | 0.0                                                                                | 0.0  | 0.0  | 12.4 | 0.0  | 0.7  | 0.4  | 6.9  | 7.2  | 7.1  | 35.5 | 35.7 |  |  |  |  |  |  |  |
| Cycle Q Clear(g_c), s         | 0.7                                                                                | 0.0  | 0.0  | 13.0 | 0.0  | 0.7  | 0.4  | 6.9  | 7.2  | 7.1  | 35.5 | 35.7 |  |  |  |  |  |  |  |
| Prop In Lane                  | 0.83                                                                               |      | 0.17 | 1.00 |      | 0.50 | 1.00 |      | 0.12 | 1.00 |      | 0.01 |  |  |  |  |  |  |  |
| Lane Grp Cap(c), veh/h        | 228                                                                                | 0    | 0    | 234  | 0    | 215  | 11   | 1260 | 1299 | 124  | 1373 | 1443 |  |  |  |  |  |  |  |
| V/C Ratio(X)                  | 0.03                                                                               | 0.00 | 0.00 | 0.63 | 0.00 | 0.05 | 0.44 | 0.61 | 0.61 | 0.79 | 0.71 | 0.71 |  |  |  |  |  |  |  |
| Avail Cap(c_a), veh/h         | 312                                                                                | 0    | 0    | 318  | 0    | 316  | 150  | 1260 | 1299 | 150  | 1373 | 1443 |  |  |  |  |  |  |  |
| HCM Platoon Ratio             | 1.00                                                                               | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.33 | 1.00 | 1.00 | 1.00 |  |  |  |  |  |  |  |
| Upstream Filter(I)            | 1.00                                                                               | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 | 0.82 | 0.82 | 0.82 | 1.00 | 1.00 | 1.00 |  |  |  |  |  |  |  |
| Uniform Delay (d), s/veh      | 50.0                                                                               | 0.0  | 0.0  | 55.3 | 0.0  | 50.2 | 64.2 | 1.2  | 1.2  | 59.5 | 7.2  | 7.3  |  |  |  |  |  |  |  |
| Incr Delay (d2), s/veh        | 0.0                                                                                | 0.0  | 0.0  | 2.8  | 0.0  | 0.1  | 8.2  | 1.8  | 1.8  | 16.7 | 3.1  | 3.0  |  |  |  |  |  |  |  |
| Initial Q Delay(d3),s/veh     | 0.0                                                                                | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |  |  |  |  |  |  |  |
| %ile BackOfQ(50%),veh/ln      | 0.2                                                                                | 0.0  | 0.0  | 5.3  | 0.0  | 0.3  | 0.2  | 3.6  | 3.8  | 4.1  | 18.2 | 19.1 |  |  |  |  |  |  |  |
| LnGrp Delay(d),s/veh          | 50.0                                                                               | 0.0  | 0.0  | 58.1 | 0.0  | 50.3 | 72.4 | 3.0  | 3.0  | 76.2 | 10.3 | 10.2 |  |  |  |  |  |  |  |
| LnGrp LOS                     | D                                                                                  |      |      | E    |      | D    | E    | A    | A    | E    | B    | B    |  |  |  |  |  |  |  |
| Approach Vol, veh/h           | 6                                                                                  |      |      | 157  |      |      | 1562 |      |      | 2093 |      |      |  |  |  |  |  |  |  |
| Approach Delay, s/veh         | 50.0                                                                               |      |      | 57.6 |      |      | 3.2  |      |      | 13.4 |      |      |  |  |  |  |  |  |  |
| Approach LOS                  | D                                                                                  |      |      | E    |      |      | A    |      |      | B    |      |      |  |  |  |  |  |  |  |
| Timer                         | 1                                                                                  | 2    | 3    | 4    | 5    | 6    | 7    | 8    |      |      |      |      |  |  |  |  |  |  |  |
| Assigned Phs                  | 1                                                                                  | 2    |      | 4    | 5    | 6    |      | 8    |      |      |      |      |  |  |  |  |  |  |  |
| Phs Duration (G+Y+Rc), s      | 4.8                                                                                |      |      | 20.3 | 13.1 | 96.6 |      | 20.3 |      |      |      |      |  |  |  |  |  |  |  |
| Change Period (Y+Rc), s       | 4.0                                                                                | 5.0  |      | 5.0  | 4.0  | 5.0  |      | 5.0  |      |      |      |      |  |  |  |  |  |  |  |
| Max Green Setting (Gmax), s   | 1.0                                                                                | 82.0 |      | 23.0 | 11.0 | 82.0 |      | 23.0 |      |      |      |      |  |  |  |  |  |  |  |
| Max Q Clear Time (g_c+1.0), s | 1.0                                                                                | 37.7 |      | 15.0 | 9.1  | 9.2  |      | 2.7  |      |      |      |      |  |  |  |  |  |  |  |
| Green Ext Time (p_c), s       | 0.0                                                                                | 34.5 |      | 0.3  | 0.0  | 30.8 |      | 0.0  |      |      |      |      |  |  |  |  |  |  |  |
| <b>Intersection Summary</b>   |                                                                                    |      |      |      |      |      |      |      |      |      |      |      |  |  |  |  |  |  |  |
| HCM 2010 Ctrl Delay           | 11.1                                                                               |      |      |      |      |      |      |      |      |      |      |      |  |  |  |  |  |  |  |
| HCM 2010 LOS                  | B                                                                                  |      |      |      |      |      |      |      |      |      |      |      |  |  |  |  |  |  |  |

# HCM 2010 Signalized Intersection Summary

## 9: Honoapiilani Highway & Front Street/Flemming Road

08/16/2017

|                             |  |      |      |      |      |       |      |      |      |      |      |      |  |  |  |  |  |  |  |
|-----------------------------|------------------------------------------------------------------------------------|------|------|------|------|-------|------|------|------|------|------|------|--|--|--|--|--|--|--|
| Movement                    | EBL                                                                                | EBT  | EBR  | WBL  | WBT  | WBR   | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |  |  |  |  |  |  |  |
| Lane Configurations         |                                                                                    | ↔    |      |      | ↔    |       | ↔    | ↔    |      | ↔    | ↔    | ↔    |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)      | 135                                                                                | 5    | 15   | 65   | 5    | 15    | 15   | 1290 | 15   | 10   | 1605 | 265  |  |  |  |  |  |  |  |
| Future Volume (veh/h)       | 135                                                                                | 5    | 15   | 65   | 5    | 15    | 15   | 1290 | 15   | 10   | 1605 | 265  |  |  |  |  |  |  |  |
| Number                      | 3                                                                                  | 8    | 18   | 7    | 4    | 14    | 1    | 6    | 16   | 5    | 2    | 12   |  |  |  |  |  |  |  |
| Initial Q (Qb), veh         | 0                                                                                  | 0    | 0    | 0    | 0    | 0     | 0    | 0    | 0    | 0    | 0    | 0    |  |  |  |  |  |  |  |
| Ped-Bike Adj(A_pbT)         | 1.00                                                                               |      | 1.00 | 1.00 |      | 1.00  | 1.00 |      | 1.00 | 1.00 |      | 1.00 |  |  |  |  |  |  |  |
| Parking Bus, Adj            | 1.00                                                                               | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  |  |  |  |  |  |  |
| Adj Sat Flow, veh/h/ln      | 1900                                                                               | 1863 | 1900 | 1900 | 1863 | 1900  | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 |  |  |  |  |  |  |  |
| Adj Flow Rate, veh/h        | 147                                                                                | 5    | 13   | 71   | 5    | 9     | 16   | 1402 | 15   | 11   | 1745 | 212  |  |  |  |  |  |  |  |
| Adj No. of Lanes            | 0                                                                                  | 1    | 0    | 0    | 1    | 0     | 1    | 2    | 0    | 1    | 2    | 1    |  |  |  |  |  |  |  |
| Peak Hour Factor            | 0.92                                                                               | 0.92 | 0.92 | 0.92 | 0.92 | 0.92  | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |  |  |  |  |  |  |  |
| Percent Heavy Veh, %        | 2                                                                                  | 2    | 2    | 2    | 2    | 2     | 2    | 2    | 2    | 2    | 2    | 2    |  |  |  |  |  |  |  |
| Cap, veh/h                  | 228                                                                                | 6    | 16   | 226  | 17   | 23    | 19   | 2757 | 29   | 13   | 2709 | 1211 |  |  |  |  |  |  |  |
| Arrive On Green             | 0.13                                                                               | 0.13 | 0.12 | 0.13 | 0.13 | 0.12  | 0.01 | 0.77 | 0.76 | 0.01 | 0.77 | 0.77 |  |  |  |  |  |  |  |
| Sat Flow, veh/h             | 1339                                                                               | 46   | 118  | 1336 | 132  | 174   | 1774 | 3587 | 38   | 1774 | 3539 | 1582 |  |  |  |  |  |  |  |
| Grp Volume(v), veh/h        | 165                                                                                | 0    | 0    | 85   | 0    | 0     | 16   | 691  | 726  | 11   | 1745 | 212  |  |  |  |  |  |  |  |
| Grp Sat Flow(s),veh/h/ln    | 1503                                                                               | 0    | 0    | 1642 | 0    | 0     | 1774 | 1770 | 1856 | 1774 | 1770 | 1582 |  |  |  |  |  |  |  |
| Q Serve(g_s), s             | 7.8                                                                                | 0.0  | 0.0  | 0.0  | 0.0  | 0.0   | 1.2  | 19.3 | 19.3 | 0.8  | 29.6 | 4.7  |  |  |  |  |  |  |  |
| Cycle Q Clear(g_c), s       | 13.7                                                                               | 0.0  | 0.0  | 5.9  | 0.0  | 0.0   | 1.2  | 19.3 | 19.3 | 0.8  | 29.6 | 4.7  |  |  |  |  |  |  |  |
| Prop In Lane                | 0.89                                                                               |      | 0.08 | 0.84 |      | 0.11  | 1.00 |      | 0.02 | 1.00 |      | 1.00 |  |  |  |  |  |  |  |
| Lane Grp Cap(c), veh/h      | 250                                                                                | 0    | 0    | 267  | 0    | 0     | 19   | 1360 | 1427 | 13   | 2709 | 1211 |  |  |  |  |  |  |  |
| V/C Ratio(X)                | 0.66                                                                               | 0.00 | 0.00 | 0.32 | 0.00 | 0.00  | 0.84 | 0.51 | 0.51 | 0.82 | 0.64 | 0.18 |  |  |  |  |  |  |  |
| Avail Cap(c_a), veh/h       | 347                                                                                | 0    | 0    | 365  | 0    | 0     | 109  | 1360 | 1427 | 109  | 2709 | 1211 |  |  |  |  |  |  |  |
| HCM Platoon Ratio           | 1.00                                                                               | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  |  |  |  |  |  |  |
| Upstream Filter(I)          | 1.00                                                                               | 0.00 | 0.00 | 1.00 | 0.00 | 0.00  | 0.75 | 0.75 | 0.75 | 0.61 | 0.61 | 0.61 |  |  |  |  |  |  |  |
| Uniform Delay (d), s/veh    | 54.8                                                                               | 0.0  | 0.0  | 51.7 | 0.0  | 0.0   | 64.2 | 5.7  | 5.7  | 64.4 | 7.1  | 4.1  |  |  |  |  |  |  |  |
| Incr Delay (d2), s/veh      | 3.0                                                                                | 0.0  | 0.0  | 0.7  | 0.0  | 0.0   | 23.1 | 1.0  | 1.0  | 23.3 | 0.7  | 0.2  |  |  |  |  |  |  |  |
| Initial Q Delay(d3),s/veh   | 0.0                                                                                | 0.0  | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |  |  |  |  |  |  |  |
| %ile BackOfQ(50%),veh/ln    | 6.0                                                                                | 0.0  | 0.0  | 2.8  | 0.0  | 0.0   | 0.7  | 9.6  | 10.1 | 0.5  | 14.6 | 2.1  |  |  |  |  |  |  |  |
| LnGrp Delay(d),s/veh        | 57.7                                                                               | 0.0  | 0.0  | 52.3 | 0.0  | 0.0   | 87.3 | 6.7  | 6.7  | 87.7 | 7.8  | 4.3  |  |  |  |  |  |  |  |
| LnGrp LOS                   | E                                                                                  |      |      | D    |      |       | F    | A    | A    | F    | A    | A    |  |  |  |  |  |  |  |
| Approach Vol, veh/h         | 165                                                                                |      |      | 85   |      |       | 1433 |      |      | 1968 |      |      |  |  |  |  |  |  |  |
| Approach Delay, s/veh       | 57.7                                                                               |      |      | 52.3 |      |       | 7.6  |      |      | 7.9  |      |      |  |  |  |  |  |  |  |
| Approach LOS                | E                                                                                  |      |      | D    |      |       | A    |      |      | A    |      |      |  |  |  |  |  |  |  |
| Timer                       | 1                                                                                  | 2    | 3    | 4    | 5    | 6     | 7    | 8    |      |      |      |      |  |  |  |  |  |  |  |
| Assigned Phs                | 1                                                                                  | 2    |      | 4    | 5    | 6     |      | 8    |      |      |      |      |  |  |  |  |  |  |  |
| Phs Duration (G+Y+Rc), s    | 103.5                                                                              |      |      | 21.1 | 5.0  | 103.9 |      | 21.1 |      |      |      |      |  |  |  |  |  |  |  |
| Change Period (Y+Rc), s     | 4.0                                                                                | 5.0  |      | 5.0  | 4.0  | 5.0   |      | 5.0  |      |      |      |      |  |  |  |  |  |  |  |
| Max Green Setting (Gmax), s | 83.0                                                                               |      |      | 25.0 | 8.0  | 83.0  |      | 25.0 |      |      |      |      |  |  |  |  |  |  |  |
| Max Q Clear Time (g_c+1), s | 31.6                                                                               |      |      | 7.9  | 2.8  | 21.3  |      | 15.7 |      |      |      |      |  |  |  |  |  |  |  |
| Green Ext Time (p_c), s     | 0.0                                                                                | 42.2 |      | 0.2  | 0.0  | 33.3  |      | 0.4  |      |      |      |      |  |  |  |  |  |  |  |
| <b>Intersection Summary</b> |                                                                                    |      |      |      |      |       |      |      |      |      |      |      |  |  |  |  |  |  |  |
| HCM 2010 Ctrl Delay         | 11.1                                                                               |      |      |      |      |       |      |      |      |      |      |      |  |  |  |  |  |  |  |
| HCM 2010 LOS                | B                                                                                  |      |      |      |      |       |      |      |      |      |      |      |  |  |  |  |  |  |  |

# HCM 2010 Signalized Intersection Summary

## 10: Honoapiilani Highway & Kapunakea Street

08/16/2017

|                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                              |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)       | 190                                                                               | 20                                                                                | 50                                                                                | 90                                                                                | 20                                                                                | 20                                                                                | 60                                                                                | 1320                                                                              | 60                                                                                | 15                                                                                  | 1615                                                                                | 130                                                                                 |
| Future Volume (veh/h)        | 190                                                                               | 20                                                                                | 50                                                                                | 90                                                                                | 20                                                                                | 20                                                                                | 60                                                                                | 1320                                                                              | 60                                                                                | 15                                                                                  | 1615                                                                                | 130                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 207                                                                               | 22                                                                                | 11                                                                                | 98                                                                                | 22                                                                                | 4                                                                                 | 65                                                                                | 1435                                                                              | 63                                                                                | 16                                                                                  | 1755                                                                                | 137                                                                                 |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 288                                                                               | 25                                                                                | 310                                                                               | 378                                                                               | 301                                                                               | 55                                                                                | 83                                                                                | 2419                                                                              | 106                                                                               | 19                                                                                  | 2212                                                                                | 171                                                                                 |
| Arrive On Green              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.19                                                                              | 0.06                                                                              | 0.93                                                                              | 0.92                                                                              | 0.01                                                                                | 0.88                                                                                | 0.87                                                                                |
| Sat Flow, veh/h              | 1197                                                                              | 127                                                                               | 1576                                                                              | 1380                                                                              | 1533                                                                              | 279                                                                               | 1774                                                                              | 3453                                                                              | 151                                                                               | 1774                                                                                | 3330                                                                                | 257                                                                                 |
| Grp Volume(v), veh/h         | 229                                                                               | 0                                                                                 | 11                                                                                | 98                                                                                | 0                                                                                 | 26                                                                                | 65                                                                                | 734                                                                               | 764                                                                               | 16                                                                                  | 923                                                                                 | 969                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1325                                                                              | 0                                                                                 | 1576                                                                              | 1380                                                                              | 0                                                                                 | 1812                                                                              | 1774                                                                              | 1770                                                                              | 1835                                                                              | 1774                                                                                | 1770                                                                                | 1817                                                                                |
| Q Serve(g_s), s              | 20.6                                                                              | 0.0                                                                               | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 1.5                                                                               | 4.7                                                                               | 8.2                                                                               | 8.4                                                                               | 1.2                                                                                 | 25.7                                                                                | 28.0                                                                                |
| Cycle Q Clear(g_c), s        | 22.1                                                                              | 0.0                                                                               | 0.7                                                                               | 6.5                                                                               | 0.0                                                                               | 1.5                                                                               | 4.7                                                                               | 8.2                                                                               | 8.4                                                                               | 1.2                                                                                 | 25.7                                                                                | 28.0                                                                                |
| Prop In Lane                 | 0.90                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.15                                                                              | 1.00                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                                |                                                                                     | 0.14                                                                                |
| Lane Grp Cap(c), veh/h       | 313                                                                               | 0                                                                                 | 310                                                                               | 378                                                                               | 0                                                                                 | 356                                                                               | 83                                                                                | 1239                                                                              | 1285                                                                              | 19                                                                                  | 1176                                                                                | 1207                                                                                |
| V/C Ratio(X)                 | 0.73                                                                              | 0.00                                                                              | 0.04                                                                              | 0.26                                                                              | 0.00                                                                              | 0.07                                                                              | 0.79                                                                              | 0.59                                                                              | 0.59                                                                              | 0.84                                                                                | 0.78                                                                                | 0.80                                                                                |
| Avail Cap(c_a), veh/h        | 372                                                                               | 0                                                                                 | 376                                                                               | 435                                                                               | 0                                                                                 | 432                                                                               | 109                                                                               | 1239                                                                              | 1285                                                                              | 109                                                                                 | 1176                                                                                | 1207                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.33                                                                              | 1.33                                                                              | 1.33                                                                              | 1.33                                                                                | 1.33                                                                                | 1.33                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.63                                                                              | 0.63                                                                              | 0.63                                                                              | 0.69                                                                                | 0.69                                                                                | 0.69                                                                                |
| Uniform Delay (d), s/veh     | 51.6                                                                              | 0.0                                                                               | 42.3                                                                              | 44.6                                                                              | 0.0                                                                               | 42.6                                                                              | 60.3                                                                              | 1.6                                                                               | 1.6                                                                               | 64.0                                                                                | 4.0                                                                                 | 4.2                                                                                 |
| Incr Delay (d2), s/veh       | 5.9                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.1                                                                               | 11.4                                                                              | 1.3                                                                               | 1.3                                                                               | 21.5                                                                                | 3.7                                                                                 | 4.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 8.5                                                                               | 0.0                                                                               | 0.3                                                                               | 3.0                                                                               | 0.0                                                                               | 0.8                                                                               | 2.6                                                                               | 4.2                                                                               | 4.3                                                                               | 0.7                                                                                 | 13.0                                                                                | 14.5                                                                                |
| LnGrp Delay(d),s/veh         | 57.5                                                                              | 0.0                                                                               | 42.3                                                                              | 44.9                                                                              | 0.0                                                                               | 42.7                                                                              | 71.7                                                                              | 2.9                                                                               | 2.9                                                                               | 85.5                                                                                | 7.8                                                                                 | 8.2                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 |                                                                                   | D                                                                                 | E                                                                                 | A                                                                                 | A                                                                                 | F                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 240                                                                               |                                                                                   |                                                                                   |                                                                                   | 124                                                                               |                                                                                   |                                                                                   |                                                                                   | 1563                                                                              |                                                                                     | 1908                                                                                |                                                                                     |
| Approach Delay, s/veh        | 56.8                                                                              |                                                                                   |                                                                                   |                                                                                   | 44.5                                                                              |                                                                                   |                                                                                   |                                                                                   | 5.8                                                                               |                                                                                     | 8.7                                                                                 |                                                                                     |
| Approach LOS                 | E                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   | A                                                                                 |                                                                                     | A                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 30.1                                                                              | 90.4                                                                              |                                                                                   |                                                                                   | 29.6                                                                              | 5.4                                                                               | 95.1                                                                              | 29.6                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 78.0                                                                              | 78.0                                                                              |                                                                                   |                                                                                   | 30.0                                                                              | 8.0                                                                               | 78.0                                                                              | 30.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+10), s | 30.0                                                                              | 30.0                                                                              |                                                                                   |                                                                                   | 8.5                                                                               | 3.2                                                                               | 10.4                                                                              | 24.1                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 34.5                                                                              |                                                                                   |                                                                                   | 0.4                                                                               | 0.0                                                                               | 27.7                                                                              | 0.5                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 11.7                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 11: Honoapiilani Highway & Keawe Street

08/16/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |   |  |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                                | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                   |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)        | 60                                                                                | 150                                                                               | 90                                                                                | 145                                                                               | 130                                                                               | 655                                                                               | 80                                                                                | 720                                                                               | 195                                                                                | 575                                                                                 | 955                                                                                 | 100                                                                                 |
| Future Volume (veh/h)         | 60                                                                                | 150                                                                               | 90                                                                                | 145                                                                               | 130                                                                               | 655                                                                               | 80                                                                                | 720                                                                               | 195                                                                                | 575                                                                                 | 955                                                                                 | 100                                                                                 |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                 | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 0.98                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h          | 65                                                                                | 163                                                                               | 10                                                                                | 158                                                                               | 141                                                                               | 322                                                                               | 87                                                                                | 783                                                                               | 127                                                                                | 625                                                                                 | 1038                                                                                | 104                                                                                 |
| Adj No. of Lanes              | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 2                                                                                 | 1                                                                                  | 2                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 100                                                                               | 195                                                                               | 267                                                                               | 253                                                                               | 560                                                                               | 463                                                                               | 110                                                                               | 1423                                                                              | 628                                                                                | 705                                                                                 | 1771                                                                                | 177                                                                                 |
| Arrive On Green               | 0.18                                                                              | 0.18                                                                              | 0.18                                                                              | 0.09                                                                              | 0.30                                                                              | 0.30                                                                              | 0.06                                                                              | 0.40                                                                              | 0.40                                                                               | 0.14                                                                                | 0.37                                                                                | 0.36                                                                                |
| Sat Flow, veh/h               | 366                                                                               | 1107                                                                              | 1511                                                                              | 1774                                                                              | 1863                                                                              | 1541                                                                              | 1774                                                                              | 3539                                                                              | 1562                                                                               | 3442                                                                                | 3249                                                                                | 325                                                                                 |
| Grp Volume(v), veh/h          | 228                                                                               | 0                                                                                 | 10                                                                                | 158                                                                               | 141                                                                               | 322                                                                               | 87                                                                                | 783                                                                               | 127                                                                                | 625                                                                                 | 565                                                                                 | 577                                                                                 |
| Grp Sat Flow(s),veh/h/ln      | 1473                                                                              | 0                                                                                 | 1511                                                                              | 1774                                                                              | 1863                                                                              | 1541                                                                              | 1774                                                                              | 1770                                                                              | 1562                                                                               | 1721                                                                                | 1770                                                                                | 1805                                                                                |
| Q Serve(g_s), s               | 17.2                                                                              | 0.0                                                                               | 0.7                                                                               | 9.1                                                                               | 7.4                                                                               | 24.0                                                                              | 6.3                                                                               | 22.1                                                                              | 6.9                                                                                | 23.2                                                                                | 33.5                                                                                | 33.6                                                                                |
| Cycle Q Clear(g_c), s         | 19.5                                                                              | 0.0                                                                               | 0.7                                                                               | 9.1                                                                               | 7.4                                                                               | 24.0                                                                              | 6.3                                                                               | 22.1                                                                              | 6.9                                                                                | 23.2                                                                                | 33.5                                                                                | 33.6                                                                                |
| Prop In Lane                  | 0.29                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                               | 1.00                                                                                |                                                                                     | 0.18                                                                                |
| Lane Grp Cap(c), veh/h        | 296                                                                               | 0                                                                                 | 267                                                                               | 253                                                                               | 560                                                                               | 463                                                                               | 110                                                                               | 1423                                                                              | 628                                                                                | 705                                                                                 | 965                                                                                 | 984                                                                                 |
| V/C Ratio(X)                  | 0.77                                                                              | 0.00                                                                              | 0.04                                                                              | 0.62                                                                              | 0.25                                                                              | 0.70                                                                              | 0.79                                                                              | 0.55                                                                              | 0.20                                                                               | 0.89                                                                                | 0.59                                                                                | 0.59                                                                                |
| Avail Cap(c_a), veh/h         | 329                                                                               | 0                                                                                 | 302                                                                               | 278                                                                               | 630                                                                               | 521                                                                               | 328                                                                               | 1423                                                                              | 628                                                                                | 953                                                                                 | 965                                                                                 | 984                                                                                 |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 0.67                                                                                | 0.67                                                                                | 0.67                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.79                                                                              | 0.79                                                                              | 0.79                                                                               | 0.50                                                                                | 0.50                                                                                | 0.50                                                                                |
| Uniform Delay (d), s/veh      | 51.8                                                                              | 0.0                                                                               | 44.4                                                                              | 38.5                                                                              | 34.4                                                                              | 40.2                                                                              | 60.2                                                                              | 29.8                                                                              | 25.3                                                                               | 54.6                                                                                | 29.4                                                                                | 29.5                                                                                |
| Incr Delay (d2), s/veh        | 9.7                                                                               | 0.0                                                                               | 0.1                                                                               | 3.7                                                                               | 0.2                                                                               | 3.5                                                                               | 3.8                                                                               | 1.2                                                                               | 0.6                                                                                | 3.4                                                                                 | 1.3                                                                                 | 1.3                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 8.8                                                                               | 0.0                                                                               | 0.3                                                                               | 4.7                                                                               | 3.9                                                                               | 10.6                                                                              | 3.2                                                                               | 11.0                                                                              | 3.1                                                                                | 11.4                                                                                | 16.8                                                                                | 17.1                                                                                |
| LnGrp Delay(d),s/veh          | 61.6                                                                              | 0.0                                                                               | 44.4                                                                              | 42.2                                                                              | 34.6                                                                              | 43.7                                                                              | 64.0                                                                              | 31.0                                                                              | 25.9                                                                               | 58.0                                                                                | 30.7                                                                                | 30.8                                                                                |
| LnGrp LOS                     | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 | C                                                                                 | D                                                                                 | E                                                                                 | C                                                                                 | C                                                                                  | E                                                                                   | C                                                                                   | C                                                                                   |
| Approach Vol, veh/h           | 238                                                                               |                                                                                   |                                                                                   |                                                                                   | 621                                                                               |                                                                                   |                                                                                   |                                                                                   | 997                                                                                |                                                                                     | 1767                                                                                |                                                                                     |
| Approach Delay, s/veh         | 60.8                                                                              |                                                                                   |                                                                                   |                                                                                   | 41.2                                                                              |                                                                                   |                                                                                   |                                                                                   | 33.3                                                                               |                                                                                     | 40.4                                                                                |                                                                                     |
| Approach LOS                  | E                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   | C                                                                                  |                                                                                     | D                                                                                   |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 12.0                                                                              | 74.9                                                                              | 16.1                                                                              | 26.9                                                                              | 30.6                                                                              | 56.3                                                                              | 43.1                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 24.0                                                                              | 49.0                                                                              | 13.0                                                                              | 25.0                                                                              | 36.0                                                                              | 37.0                                                                              | 43.0                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.3), s | 19.3                                                                              | 35.6                                                                              | 11.1                                                                              | 21.5                                                                              | 25.2                                                                              | 24.1                                                                              | 26.0                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.1                                                                               | 8.0                                                                               | 0.1                                                                               | 0.3                                                                               | 1.5                                                                               | 6.5                                                                               | 2.0                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           |                                                                                   |                                                                                   | 39.9                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Notes                         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |

HCM 2010 TWSC  
12: RIRO Access & Honoapiilani Highway

08/16/2017

| Intersection             |        |                                                                                   |                                                                                   |                                                                                   |      |                                                                                     |
|--------------------------|--------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh         | 0      |                                                                                   |                                                                                   |                                                                                   |      |                                                                                     |
| Movement                 | WBL    | WBR                                                                               | NBT                                                                               | NBR                                                                               | SBL  | SBT                                                                                 |
| Lane Configurations      |        |  |  |  |      |  |
| Traffic Vol, veh/h       | 0      | 0                                                                                 | 615                                                                               | 0                                                                                 | 0    | 735                                                                                 |
| Future Vol, veh/h        | 0      | 0                                                                                 | 615                                                                               | 0                                                                                 | 0    | 735                                                                                 |
| Conflicting Peds, #/hr   | 0      | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   |
| Sign Control             | Stop   | Stop                                                                              | Free                                                                              | Free                                                                              | Free | Free                                                                                |
| RT Channelized           | -      | None                                                                              | -                                                                                 | None                                                                              | -    | None                                                                                |
| Storage Length           | -      | 0                                                                                 | -                                                                                 | 0                                                                                 | -    | -                                                                                   |
| Veh in Median Storage, # | 0      | -                                                                                 | 0                                                                                 | -                                                                                 | -    | 0                                                                                   |
| Grade, %                 | 0      | -                                                                                 | 0                                                                                 | -                                                                                 | -    | 0                                                                                   |
| Peak Hour Factor         | 92     | 92                                                                                | 92                                                                                | 92                                                                                | 92   | 92                                                                                  |
| Heavy Vehicles, %        | 2      | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                   |
| Mvmt Flow                | 0      | 0                                                                                 | 668                                                                               | 0                                                                                 | 0    | 799                                                                                 |
| Major/Minor              | Minor1 | Major1                                                                            |                                                                                   | Major2                                                                            |      |                                                                                     |
| Conflicting Flow All     | -      | 668                                                                               | 0                                                                                 | 0                                                                                 | -    | -                                                                                   |
| Stage 1                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Stage 2                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Critical Hdwy            | -      | 6.22                                                                              | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Critical Hdwy Stg 1      | -      | -                                                                                 | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Critical Hdwy Stg 2      | -      | -                                                                                 | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Follow-up Hdwy           | -      | 3.318                                                                             | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Pot Cap-1 Maneuver       | 0      | 458                                                                               | -                                                                                 | -                                                                                 | 0    | -                                                                                   |
| Stage 1                  | 0      | -                                                                                 | -                                                                                 | -                                                                                 | 0    | -                                                                                   |
| Stage 2                  | 0      | -                                                                                 | -                                                                                 | -                                                                                 | 0    | -                                                                                   |
| Platoon blocked, %       |        |                                                                                   | -                                                                                 | -                                                                                 |      | -                                                                                   |
| Mov Cap-1 Maneuver       | -      | 458                                                                               | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Mov Cap-2 Maneuver       | -      | -                                                                                 | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Stage 1                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Stage 2                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Approach                 | WB     | NB                                                                                |                                                                                   | SB                                                                                |      |                                                                                     |
| HCM Control Delay, s     | 0      | 0                                                                                 |                                                                                   | 0                                                                                 |      |                                                                                     |
| HCM LOS                  | A      |                                                                                   |                                                                                   |                                                                                   |      |                                                                                     |
| Minor Lane/Major Mvmt    | NBT    | NBRWBLn1                                                                          | SBT                                                                               |                                                                                   |      |                                                                                     |
| Capacity (veh/h)         | -      | -                                                                                 | -                                                                                 |                                                                                   |      |                                                                                     |
| HCM Lane V/C Ratio       | -      | -                                                                                 | -                                                                                 |                                                                                   |      |                                                                                     |
| HCM Control Delay (s)    | -      | -                                                                                 | 0                                                                                 |                                                                                   |      |                                                                                     |
| HCM Lane LOS             | -      | -                                                                                 | A                                                                                 |                                                                                   |      |                                                                                     |
| HCM 95th %tile Q(veh)    | -      | -                                                                                 | -                                                                                 |                                                                                   |      |                                                                                     |

| Intersection             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh         | 0                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Movement                 | WBL                                                                               | WBR                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 |
| Lane Configurations      |  |  |  |  |  |  |
| Traffic Vol, veh/h       | 0                                                                                 | 0                                                                                 | 680                                                                               | 0                                                                                 | 0                                                                                   | 790                                                                                 |
| Future Vol, veh/h        | 0                                                                                 | 0                                                                                 | 680                                                                               | 0                                                                                 | 0                                                                                   | 790                                                                                 |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   |
| Sign Control             | Stop                                                                              | Stop                                                                              | Free                                                                              | Free                                                                              | Free                                                                                | Free                                                                                |
| RT Channelized           | -                                                                                 | None                                                                              | -                                                                                 | None                                                                              | -                                                                                   | None                                                                                |
| Storage Length           | 0                                                                                 | 100                                                                               | -                                                                                 | 100                                                                               | 100                                                                                 | -                                                                                   |
| Veh in Median Storage, # | 0                                                                                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                   | 0                                                                                   |
| Grade, %                 | 0                                                                                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                   | 0                                                                                   |
| Peak Hour Factor         | 92                                                                                | 92                                                                                | 92                                                                                | 92                                                                                | 92                                                                                  | 92                                                                                  |
| Heavy Vehicles, %        | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   |
| Mvmt Flow                | 0                                                                                 | 0                                                                                 | 739                                                                               | 0                                                                                 | 0                                                                                   | 859                                                                                 |
| Major/Minor              | Minor1                                                                            | Major1                                                                            |                                                                                   | Major2                                                                            |                                                                                     |                                                                                     |
| Conflicting Flow All     | 1598                                                                              | 739                                                                               | 0                                                                                 | 0                                                                                 | 739                                                                                 | 0                                                                                   |
| Stage 1                  | 739                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 2                  | 859                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Critical Hdwy            | 6.42                                                                              | 6.22                                                                              | -                                                                                 | -                                                                                 | 4.12                                                                                | -                                                                                   |
| Critical Hdwy Stg 1      | 5.42                                                                              | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Critical Hdwy Stg 2      | 5.42                                                                              | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Follow-up Hdwy           | 3.518                                                                             | 3.318                                                                             | -                                                                                 | -                                                                                 | 2.218                                                                               | -                                                                                   |
| Pot Cap-1 Maneuver       | 117                                                                               | 417                                                                               | -                                                                                 | -                                                                                 | 867                                                                                 | -                                                                                   |
| Stage 1                  | 472                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 2                  | 415                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Platoon blocked, %       |                                                                                   |                                                                                   | -                                                                                 | -                                                                                 |                                                                                     | -                                                                                   |
| Mov Cap-1 Maneuver       | 117                                                                               | 417                                                                               | -                                                                                 | -                                                                                 | 867                                                                                 | -                                                                                   |
| Mov Cap-2 Maneuver       | 255                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 1                  | 472                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 2                  | 415                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Approach                 | WB                                                                                | NB                                                                                |                                                                                   | SB                                                                                |                                                                                     |                                                                                     |
| HCM Control Delay, s     | 0                                                                                 | 0                                                                                 |                                                                                   | 0                                                                                 |                                                                                     |                                                                                     |
| HCM LOS                  | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Minor Lane/Major Mvmt    | NBT                                                                               | NBRWBLn1WBLn2                                                                     | SBL                                                                               | SBT                                                                               |                                                                                     |                                                                                     |
| Capacity (veh/h)         | -                                                                                 | -                                                                                 | -                                                                                 | 867                                                                               | -                                                                                   |                                                                                     |
| HCM Lane V/C Ratio       | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   |                                                                                     |
| HCM Control Delay (s)    | -                                                                                 | -                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   |                                                                                     |
| HCM Lane LOS             | -                                                                                 | -                                                                                 | A                                                                                 | A                                                                                 | A                                                                                   |                                                                                     |
| HCM 95th %tile Q(veh)    | -                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -                                                                                   |                                                                                     |

| Intersection             |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |      |                                                                                     |      |      |                                                                                     |      |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|------|-------------------------------------------------------------------------------------|------|------|-------------------------------------------------------------------------------------|------|
| Int Delay, s/veh         | 3                                                                                 |                                                                                   |      |                                                                                   |                                                                                   |      |      |                                                                                     |      |      |                                                                                     |      |
| Movement                 | EBL                                                                               | EBT                                                                               | EBR  | WBL                                                                               | WBT                                                                               | WBR  | NBL  | NBT                                                                                 | NBR  | SBL  | SBT                                                                                 | SBR  |
| Lane Configurations      |  |  |      |  |  |      |      |  |      |      |  |      |
| Traffic Vol, veh/h       | 15                                                                                | 55                                                                                | 10   | 5                                                                                 | 55                                                                                | 5    | 10   | 5                                                                                   | 5    | 5    | 5                                                                                   | 15   |
| Future Vol, veh/h        | 15                                                                                | 55                                                                                | 10   | 5                                                                                 | 55                                                                                | 5    | 10   | 5                                                                                   | 5    | 5    | 5                                                                                   | 15   |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0    | 0                                                                                   | 0    | 0    | 0                                                                                   | 0    |
| Sign Control             | Free                                                                              | Free                                                                              | Free | Free                                                                              | Free                                                                              | Free | Stop | Stop                                                                                | Stop | Stop | Stop                                                                                | Stop |
| RT Channelized           | -                                                                                 | -                                                                                 | None | -                                                                                 | -                                                                                 | None | -    | -                                                                                   | None | -    | -                                                                                   | None |
| Storage Length           | 100                                                                               | -                                                                                 | -    | 100                                                                               | -                                                                                 | -    | -    | -                                                                                   | -    | -    | -                                                                                   | -    |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | -    | -                                                                                 | 0                                                                                 | -    | -    | 0                                                                                   | -    | -    | 0                                                                                   | -    |
| Grade, %                 | -                                                                                 | 0                                                                                 | -    | -                                                                                 | 0                                                                                 | -    | -    | 0                                                                                   | -    | -    | 0                                                                                   | -    |
| Peak Hour Factor         | 92                                                                                | 92                                                                                | 92   | 92                                                                                | 92                                                                                | 92   | 92   | 92                                                                                  | 92   | 92   | 92                                                                                  | 92   |
| Heavy Vehicles, %        | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    | 2    | 2                                                                                   | 2    | 2    | 2                                                                                   | 2    |
| Mvmt Flow                | 16                                                                                | 60                                                                                | 11   | 5                                                                                 | 60                                                                                | 5    | 11   | 5                                                                                   | 5    | 5    | 5                                                                                   | 16   |

| Major/Minor          | Major1 |   |   | Major2 |   |   | Minor1 |       |       | Minor2 |       |       |
|----------------------|--------|---|---|--------|---|---|--------|-------|-------|--------|-------|-------|
| Conflicting Flow All | 65     | 0 | 0 | 71     | 0 | 0 | 181    | 173   | 66    | 176    | 176   | 63    |
| Stage 1              | -      | - | - | -      | - | - | 98     | 98    | -     | 73     | 73    | -     |
| Stage 2              | -      | - | - | -      | - | - | 83     | 75    | -     | 103    | 103   | -     |
| Critical Hdwy        | 4.12   | - | - | 4.12   | - | - | 7.12   | 6.52  | 6.22  | 7.12   | 6.52  | 6.22  |
| Critical Hdwy Stg 1  | -      | - | - | -      | - | - | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Critical Hdwy Stg 2  | -      | - | - | -      | - | - | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Follow-up Hdwy       | 2.218  | - | - | 2.218  | - | - | 3.518  | 4.018 | 3.318 | 3.518  | 4.018 | 3.318 |
| Pot Cap-1 Maneuver   | 1537   | - | - | 1529   | - | - | 781    | 720   | 998   | 786    | 717   | 1002  |
| Stage 1              | -      | - | - | -      | - | - | 908    | 814   | -     | 937    | 834   | -     |
| Stage 2              | -      | - | - | -      | - | - | 925    | 833   | -     | 903    | 810   | -     |
| Platoon blocked, %   |        | - | - |        | - | - |        |       |       |        |       |       |
| Mov Cap-1 Maneuver   | 1537   | - | - | 1529   | - | - | 756    | 711   | 998   | 769    | 708   | 1002  |
| Mov Cap-2 Maneuver   | -      | - | - | -      | - | - | 756    | 711   | -     | 769    | 708   | -     |
| Stage 1              | -      | - | - | -      | - | - | 899    | 806   | -     | 928    | 831   | -     |
| Stage 2              | -      | - | - | -      | - | - | 901    | 831   | -     | 883    | 802   | -     |

| Approach             | EB  | WB  | NB  | SB  |
|----------------------|-----|-----|-----|-----|
| HCM Control Delay, s | 1.4 | 0.6 | 9.7 | 9.2 |
| HCM LOS              |     |     | A   | A   |

| Minor Lane/Major Mvmt | NBLn1 | EBL   | EBT | EBR | WBL   | WBT | WBR | SBLn1 |
|-----------------------|-------|-------|-----|-----|-------|-----|-----|-------|
| Capacity (veh/h)      | 791   | 1537  | -   | -   | 1529  | -   | -   | 876   |
| HCM Lane V/C Ratio    | 0.027 | 0.011 | -   | -   | 0.004 | -   | -   | 0.031 |
| HCM Control Delay (s) | 9.7   | 7.4   | -   | -   | 7.4   | -   | -   | 9.2   |
| HCM Lane LOS          | A     | A     | -   | -   | A     | -   | -   | A     |
| HCM 95th %tile Q(veh) | 0.1   | 0     | -   | -   | 0     | -   | -   | 0.1   |



| Intersection             |        |       |      |        |       |      |        |       |       |        |       |       |
|--------------------------|--------|-------|------|--------|-------|------|--------|-------|-------|--------|-------|-------|
| Int Delay, s/veh         | 4.2    |       |      |        |       |      |        |       |       |        |       |       |
| Movement                 | EBL    | EBT   | EBR  | WBL    | WBT   | WBR  | NBL    | NBT   | NBR   | SBL    | SBT   | SBR   |
| Lane Configurations      |        | ↕     |      |        | ↕     |      |        | ↕     |       |        | ↕     |       |
| Traffic Vol, veh/h       | 10     | 20    | 25   | 5      | 25    | 5    | 25     | 5     | 5     | 5      | 5     | 10    |
| Future Vol, veh/h        | 10     | 20    | 25   | 5      | 25    | 5    | 25     | 5     | 5     | 5      | 5     | 10    |
| Conflicting Peds, #/hr   | 0      | 0     | 0    | 0      | 0     | 0    | 0      | 0     | 0     | 0      | 0     | 0     |
| Sign Control             | Free   | Free  | Free | Free   | Free  | Free | Stop   | Stop  | Stop  | Stop   | Stop  | Stop  |
| RT Channelized           | -      | -     | None | -      | -     | None | -      | -     | None  | -      | -     | None  |
| Storage Length           | -      | -     | -    | -      | -     | -    | -      | -     | -     | -      | -     | -     |
| Veh in Median Storage, # | -      | 0     | -    | -      | 0     | -    | -      | 0     | -     | -      | 0     | -     |
| Grade, %                 | -      | 0     | -    | -      | 0     | -    | -      | 0     | -     | -      | 0     | -     |
| Peak Hour Factor         | 92     | 92    | 92   | 92     | 92    | 92   | 92     | 92    | 92    | 92     | 92    | 92    |
| Heavy Vehicles, %        | 2      | 2     | 2    | 2      | 2     | 2    | 2      | 2     | 2     | 2      | 2     | 2     |
| Mvmt Flow                | 11     | 22    | 27   | 5      | 27    | 5    | 27     | 5     | 5     | 5      | 5     | 11    |
| Major/Minor              | Major1 |       |      | Major2 |       |      | Minor1 |       |       | Minor2 |       |       |
| Conflicting Flow All     | 32     | 0     | 0    | 49     | 0     | 0    | 106    | 100   | 36    | 103    | 111   | 30    |
| Stage 1                  | -      | -     | -    | -      | -     | -    | 58     | 58    | -     | 40     | 40    | -     |
| Stage 2                  | -      | -     | -    | -      | -     | -    | 48     | 42    | -     | 63     | 71    | -     |
| Critical Hdwy            | 4.12   | -     | -    | 4.12   | -     | -    | 7.12   | 6.52  | 6.22  | 7.12   | 6.52  | 6.22  |
| Critical Hdwy Stg 1      | -      | -     | -    | -      | -     | -    | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Critical Hdwy Stg 2      | -      | -     | -    | -      | -     | -    | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Follow-up Hdwy           | 2.218  | -     | -    | 2.218  | -     | -    | 3.518  | 4.018 | 3.318 | 3.518  | 4.018 | 3.318 |
| Pot Cap-1 Maneuver       | 1580   | -     | -    | 1558   | -     | -    | 873    | 790   | 1037  | 877    | 779   | 1044  |
| Stage 1                  | -      | -     | -    | -      | -     | -    | 954    | 847   | -     | 975    | 862   | -     |
| Stage 2                  | -      | -     | -    | -      | -     | -    | 965    | 860   | -     | 948    | 836   | -     |
| Platoon blocked, %       | -      | -     | -    | -      | -     | -    | -      | -     | -     | -      | -     | -     |
| Mov Cap-1 Maneuver       | 1580   | -     | -    | 1558   | -     | -    | 853    | 782   | 1037  | 861    | 771   | 1044  |
| Mov Cap-2 Maneuver       | -      | -     | -    | -      | -     | -    | 853    | 782   | -     | 861    | 771   | -     |
| Stage 1                  | -      | -     | -    | -      | -     | -    | 947    | 841   | -     | 968    | 859   | -     |
| Stage 2                  | -      | -     | -    | -      | -     | -    | 946    | 857   | -     | 930    | 830   | -     |
| Approach                 | EB     |       |      | WB     |       |      | NB     |       |       | SB     |       |       |
| HCM Control Delay, s     | 1.3    |       |      | 1      |       |      | 9.4    |       |       | 9      |       |       |
| HCM LOS                  |        |       |      |        |       |      | A      |       |       | A      |       |       |
| Minor Lane/Major Mvmt    | NBLn1  | EBL   | EBT  | EBR    | WBL   | WBT  | WBR    | SBLn1 |       |        |       |       |
| Capacity (veh/h)         | 864    | 1580  | -    | -      | 1558  | -    | -      | 914   |       |        |       |       |
| HCM Lane V/C Ratio       | 0.044  | 0.007 | -    | -      | 0.003 | -    | -      | 0.024 |       |        |       |       |
| HCM Control Delay (s)    | 9.4    | 7.3   | 0    | -      | 7.3   | 0    | -      | 9     |       |        |       |       |
| HCM Lane LOS             | A      | A     | A    | -      | A     | A    | -      | A     |       |        |       |       |
| HCM 95th %tile Q(veh)    | 0.1    | 0     | -    | -      | 0     | -    | -      | 0.1   |       |        |       |       |



---

## **APPENDIX C**

### LEVEL OF SERVICE CALCULATIONS

- Future Year 2022 Scenario 2 AM Peak
-

# HCM 2010 Signalized Intersection Summary

## 1: Honoapiilani Highway & Napilihau Street

10/05/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 50                                                                                | 45                                                                                | 305                                                                               | 95                                                                                | 50                                                                                | 20                                                                                | 240                                                                                 | 250                                                                                 | 110                                                                                 | 10                                                                                  | 140                                                                                 | 30                                                                                  |
| Future Volume (veh/h)        | 50                                                                                | 45                                                                                | 305                                                                               | 95                                                                                | 50                                                                                | 20                                                                                | 240                                                                                 | 250                                                                                 | 110                                                                                 | 10                                                                                  | 140                                                                                 | 30                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.99                                                                              | 0.99                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 54                                                                                | 49                                                                                | 43                                                                                | 103                                                                               | 54                                                                                | 11                                                                                | 261                                                                                 | 272                                                                                 | 57                                                                                  | 11                                                                                  | 152                                                                                 | 8                                                                                   |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 237                                                                               | 170                                                                               | 265                                                                               | 329                                                                               | 253                                                                               | 52                                                                                | 346                                                                                 | 803                                                                                 | 682                                                                                 | 15                                                                                  | 456                                                                                 | 387                                                                                 |
| Arrive On Green              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.19                                                                                | 0.43                                                                                | 0.43                                                                                | 0.01                                                                                | 0.24                                                                                | 0.24                                                                                |
| Sat Flow, veh/h              | 609                                                                               | 1004                                                                              | 1569                                                                              | 1290                                                                              | 1500                                                                              | 306                                                                               | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 103                                                                               | 0                                                                                 | 43                                                                                | 103                                                                               | 0                                                                                 | 65                                                                                | 261                                                                                 | 272                                                                                 | 57                                                                                  | 11                                                                                  | 152                                                                                 | 8                                                                                   |
| Grp Sat Flow(s),veh/h/ln     | 1613                                                                              | 0                                                                                 | 1569                                                                              | 1290                                                                              | 0                                                                                 | 1806                                                                              | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 0.4                                                                               | 0.0                                                                               | 1.0                                                                               | 3.1                                                                               | 0.0                                                                               | 1.3                                                                               | 5.7                                                                                 | 4.0                                                                                 | 0.9                                                                                 | 0.3                                                                                 | 2.7                                                                                 | 0.2                                                                                 |
| Cycle Q Clear(g_c), s        | 2.1                                                                               | 0.0                                                                               | 1.0                                                                               | 5.2                                                                               | 0.0                                                                               | 1.3                                                                               | 5.7                                                                                 | 4.0                                                                                 | 0.9                                                                                 | 0.3                                                                                 | 2.7                                                                                 | 0.2                                                                                 |
| Prop In Lane                 | 0.52                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.17                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 407                                                                               | 0                                                                                 | 265                                                                               | 329                                                                               | 0                                                                                 | 305                                                                               | 346                                                                                 | 803                                                                                 | 682                                                                                 | 15                                                                                  | 456                                                                                 | 387                                                                                 |
| V/C Ratio(X)                 | 0.25                                                                              | 0.00                                                                              | 0.16                                                                              | 0.31                                                                              | 0.00                                                                              | 0.21                                                                              | 0.75                                                                                | 0.34                                                                                | 0.08                                                                                | 0.72                                                                                | 0.33                                                                                | 0.02                                                                                |
| Avail Cap(c_a), veh/h        | 1048                                                                              | 0                                                                                 | 922                                                                               | 869                                                                               | 0                                                                                 | 1060                                                                              | 1302                                                                                | 3601                                                                                | 3061                                                                                | 651                                                                                 | 2917                                                                                | 2480                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 14.9                                                                              | 0.0                                                                               | 14.5                                                                              | 17.3                                                                              | 0.0                                                                               | 14.6                                                                              | 15.5                                                                                | 7.7                                                                                 | 6.9                                                                                 | 20.2                                                                                | 12.7                                                                                | 11.7                                                                                |
| Incr Delay (d2), s/veh       | 0.3                                                                               | 0.0                                                                               | 0.3                                                                               | 0.5                                                                               | 0.0                                                                               | 0.3                                                                               | 3.4                                                                                 | 0.5                                                                                 | 0.1                                                                                 | 47.4                                                                                | 0.9                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.0                                                                               | 0.0                                                                               | 0.4                                                                               | 1.2                                                                               | 0.0                                                                               | 0.7                                                                               | 3.1                                                                                 | 2.2                                                                                 | 0.4                                                                                 | 0.3                                                                                 | 1.5                                                                                 | 0.1                                                                                 |
| LnGrp Delay(d),s/veh         | 15.3                                                                              | 0.0                                                                               | 14.8                                                                              | 17.8                                                                              | 0.0                                                                               | 15.0                                                                              | 18.9                                                                                | 8.3                                                                                 | 7.0                                                                                 | 67.6                                                                                | 13.6                                                                                | 11.8                                                                                |
| LnGrp LOS                    | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 146                                                                               |                                                                                   |                                                                                   | 168                                                                               |                                                                                   |                                                                                     | 590                                                                                 |                                                                                     |                                                                                     | 171                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 15.1                                                                              |                                                                                   |                                                                                   | 16.7                                                                              |                                                                                   |                                                                                     | 12.8                                                                                |                                                                                     |                                                                                     | 17.0                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.4                                                                               | 23.6                                                                              |                                                                                   | 11.9                                                                              | 13.0                                                                              | 16.0                                                                              |                                                                                     | 11.9                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 79.0                                                                              |                                                                                   | 24.0                                                                              | 30.0                                                                              | 64.0                                                                              |                                                                                     | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.3                                                                               | 6.0                                                                               |                                                                                   | 4.1                                                                               | 7.7                                                                               | 4.7                                                                               |                                                                                     | 7.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 4.1                                                                               |                                                                                   | 0.6                                                                               | 0.7                                                                               | 1.9                                                                               |                                                                                     | 0.6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 14.4                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 2: Honoapiilani Highway & Hoohui Road

10/05/2017

|                                | <div></div> |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                       | EBL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR  | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |      |  |  |  |  |  |  |
| Traffic Volume (veh/h)         | 60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 5                                                                                 | 185                                                                               | 95                                                                                | 20                                                                                | 15   | 150                                                                               | 565                                                                               | 15                                                                                | 10                                                                                  | 535                                                                                 | 65                                                                                  |
| Future Volume (veh/h)          | 60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 5                                                                                 | 185                                                                               | 95                                                                                | 20                                                                                | 15   | 150                                                                               | 565                                                                               | 15                                                                                | 10                                                                                  | 535                                                                                 | 65                                                                                  |
| Number                         | 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18   | 5                                                                                 | 2                                                                                 | 12                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh            | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)            | 0.98                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                   | 0.98                                                                              | 0.98                                                                              |                                                                                   | 0.98 | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 0.99                                                                                |
| Parking Bus, Adj               | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln         | 1900                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h           | 65                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 5                                                                                 | 21                                                                                | 103                                                                               | 22                                                                                | 2    | 163                                                                               | 614                                                                               | 0                                                                                 | 11                                                                                  | 582                                                                                 | 29                                                                                  |
| Adj No. of Lanes               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0    | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor               | 0.92                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %           | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                     | 378                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 24                                                                                | 312                                                                               | 343                                                                               | 339                                                                               | 31   | 403                                                                               | 899                                                                               | 764                                                                               | 336                                                                                 | 742                                                                                 | 626                                                                                 |
| Arrive On Green                | 0.20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20 | 0.09                                                                              | 0.48                                                                              | 0.00                                                                              | 0.01                                                                                | 0.40                                                                                | 0.40                                                                                |
| Sat Flow, veh/h                | 1211                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 120                                                                               | 1544                                                                              | 1350                                                                              | 1679                                                                              | 153  | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1571                                                                                |
| Grp Volume(v), veh/h           | 70                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0                                                                                 | 21                                                                                | 103                                                                               | 0                                                                                 | 24   | 163                                                                               | 614                                                                               | 0                                                                                 | 11                                                                                  | 582                                                                                 | 29                                                                                  |
| Grp Sat Flow(s),veh/h/ln       | 1331                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0                                                                                 | 1544                                                                              | 1350                                                                              | 0                                                                                 | 1831 | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1571                                                                                |
| Q Serve(g_s), s                | 2.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.0                                                                               | 0.6                                                                               | 3.6                                                                               | 0.0                                                                               | 0.6  | 2.5                                                                               | 13.3                                                                              | 0.0                                                                               | 0.2                                                                                 | 14.2                                                                                | 0.6                                                                                 |
| Cycle Q Clear(g_c), s          | 2.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.0                                                                               | 0.6                                                                               | 6.2                                                                               | 0.0                                                                               | 0.6  | 2.5                                                                               | 13.3                                                                              | 0.0                                                                               | 0.2                                                                                 | 14.2                                                                                | 0.6                                                                                 |
| Prop In Lane                   | 0.93                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.08 | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h         | 402                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0                                                                                 | 312                                                                               | 343                                                                               | 0                                                                                 | 370  | 403                                                                               | 899                                                                               | 764                                                                               | 336                                                                                 | 742                                                                                 | 626                                                                                 |
| V/C Ratio(X)                   | 0.17                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.00                                                                              | 0.07                                                                              | 0.30                                                                              | 0.00                                                                              | 0.06 | 0.40                                                                              | 0.68                                                                              | 0.00                                                                              | 0.03                                                                                | 0.78                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h          | 785                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0                                                                                 | 741                                                                               | 719                                                                               | 0                                                                                 | 879  | 750                                                                               | 1824                                                                              | 1551                                                                              | 832                                                                                 | 1824                                                                                | 1539                                                                                |
| HCM Platoon Ratio              | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)             | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh       | 17.7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.0                                                                               | 16.8                                                                              | 20.3                                                                              | 0.0                                                                               | 16.8 | 9.6                                                                               | 10.4                                                                              | 0.0                                                                               | 10.0                                                                                | 13.7                                                                                | 9.6                                                                                 |
| Incr Delay (d2), s/veh         | 0.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.0                                                                               | 0.1                                                                               | 0.5                                                                               | 0.0                                                                               | 0.1  | 0.7                                                                               | 0.9                                                                               | 0.0                                                                               | 0.0                                                                                 | 1.9                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh      | 0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln       | 0.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.0                                                                               | 0.3                                                                               | 1.4                                                                               | 0.0                                                                               | 0.3  | 1.3                                                                               | 6.9                                                                               | 0.0                                                                               | 0.1                                                                                 | 7.7                                                                                 | 0.3                                                                                 |
| LnGrp Delay(d),s/veh           | 17.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.0                                                                               | 16.9                                                                              | 20.8                                                                              | 0.0                                                                               | 16.9 | 10.3                                                                              | 11.3                                                                              | 0.0                                                                               | 10.0                                                                                | 15.6                                                                                | 9.6                                                                                 |
| LnGrp LOS                      | B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                   | B                                                                                 | C                                                                                 |                                                                                   | B    | B                                                                                 | B                                                                                 |                                                                                   | B                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h            | 91                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 127  |                                                                                   | 777                                                                               |                                                                                   | 622                                                                                 |                                                                                     |                                                                                     |
| Approach Delay, s/veh          | 17.7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 20.0 |                                                                                   | 11.1                                                                              |                                                                                   | 15.2                                                                                |                                                                                     |                                                                                     |
| Approach LOS                   | B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   | C    |                                                                                   | B                                                                                 |                                                                                   | B                                                                                   |                                                                                     |                                                                                     |
| Timer                          | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6    | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                   | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2                                                                                 |                                                                                   |                                                                                   | 4                                                                                 | 5    | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s       | 5.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 31.1                                                                              |                                                                                   |                                                                                   | 15.5                                                                              | 9.8  | 26.7                                                                              | 15.5                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s        | 5.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 6.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 5.0  | 6.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s    | 15.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 51.0                                                                              |                                                                                   |                                                                                   | 25.0                                                                              | 15.0 | 51.0                                                                              | 25.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+12.2), s | 12.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 15.3                                                                              |                                                                                   |                                                                                   | 4.6                                                                               | 4.5  | 16.2                                                                              | 8.2                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s        | 0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 4.5                                                                               |                                                                                   |                                                                                   | 0.4                                                                               | 0.3  | 4.3                                                                               | 0.3                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                   | 13.8                                                                              |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 3: Honoapiilani Highway & Akahele Street

10/05/2017

|                               |  |  |  |  |  |  |  |  |  |   |  |  |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)        | 45                                                                                | 20                                                                                | 125                                                                               | 90                                                                                | 40                                                                                | 60                                                                                | 60                                                                                | 620                                                                               | 55                                                                                | 40                                                                                  | 715                                                                                 | 30                                                                                  |
| Future Volume (veh/h)         | 45                                                                                | 20                                                                                | 125                                                                               | 90                                                                                | 40                                                                                | 60                                                                                | 60                                                                                | 620                                                                               | 55                                                                                | 40                                                                                  | 715                                                                                 | 30                                                                                  |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                 | 2                                                                                 | 12                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 49                                                                                | 22                                                                                | 7                                                                                 | 98                                                                                | 43                                                                                | 6                                                                                 | 65                                                                                | 674                                                                               | 28                                                                                | 43                                                                                  | 777                                                                                 | 16                                                                                  |
| Adj No. of Lanes              | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 62                                                                                | 180                                                                               | 57                                                                                | 128                                                                               | 318                                                                               | 268                                                                               | 85                                                                                | 930                                                                               | 791                                                                               | 54                                                                                  | 898                                                                                 | 763                                                                                 |
| Arrive On Green               | 0.04                                                                              | 0.13                                                                              | 0.13                                                                              | 0.07                                                                              | 0.17                                                                              | 0.17                                                                              | 0.05                                                                              | 0.50                                                                              | 0.50                                                                              | 0.03                                                                                | 0.48                                                                                | 0.48                                                                                |
| Sat Flow, veh/h               | 1774                                                                              | 1350                                                                              | 429                                                                               | 1774                                                                              | 1863                                                                              | 1572                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h          | 49                                                                                | 0                                                                                 | 29                                                                                | 98                                                                                | 43                                                                                | 6                                                                                 | 65                                                                                | 674                                                                               | 28                                                                                | 43                                                                                  | 777                                                                                 | 16                                                                                  |
| Grp Sat Flow(s),veh/h/ln      | 1774                                                                              | 0                                                                                 | 1779                                                                              | 1774                                                                              | 1863                                                                              | 1572                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Q Serve(g_s), s               | 2.1                                                                               | 0.0                                                                               | 1.1                                                                               | 4.1                                                                               | 1.5                                                                               | 0.2                                                                               | 2.7                                                                               | 21.5                                                                              | 0.7                                                                               | 1.8                                                                                 | 28.1                                                                                | 0.4                                                                                 |
| Cycle Q Clear(g_c), s         | 2.1                                                                               | 0.0                                                                               | 1.1                                                                               | 4.1                                                                               | 1.5                                                                               | 0.2                                                                               | 2.7                                                                               | 21.5                                                                              | 0.7                                                                               | 1.8                                                                                 | 28.1                                                                                | 0.4                                                                                 |
| Prop In Lane                  | 1.00                                                                              |                                                                                   | 0.24                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 62                                                                                | 0                                                                                 | 237                                                                               | 128                                                                               | 318                                                                               | 268                                                                               | 85                                                                                | 930                                                                               | 791                                                                               | 54                                                                                  | 898                                                                                 | 763                                                                                 |
| V/C Ratio(X)                  | 0.78                                                                              | 0.00                                                                              | 0.12                                                                              | 0.76                                                                              | 0.14                                                                              | 0.02                                                                              | 0.77                                                                              | 0.72                                                                              | 0.04                                                                              | 0.79                                                                                | 0.87                                                                                | 0.02                                                                                |
| Avail Cap(c_a), veh/h         | 469                                                                               | 0                                                                                 | 494                                                                               | 469                                                                               | 517                                                                               | 436                                                                               | 586                                                                               | 1599                                                                              | 1359                                                                              | 586                                                                                 | 1599                                                                                | 1359                                                                                |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 36.2                                                                              | 0.0                                                                               | 28.9                                                                              | 34.5                                                                              | 26.7                                                                              | 26.1                                                                              | 35.6                                                                              | 14.9                                                                              | 9.7                                                                               | 36.5                                                                                | 17.4                                                                                | 10.3                                                                                |
| Incr Delay (d2), s/veh        | 18.9                                                                              | 0.0                                                                               | 0.2                                                                               | 9.0                                                                               | 0.2                                                                               | 0.0                                                                               | 13.3                                                                              | 1.1                                                                               | 0.0                                                                               | 22.1                                                                                | 2.7                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 1.3                                                                               | 0.0                                                                               | 0.5                                                                               | 2.3                                                                               | 0.8                                                                               | 0.1                                                                               | 1.6                                                                               | 11.1                                                                              | 0.3                                                                               | 1.2                                                                                 | 14.9                                                                                | 0.2                                                                                 |
| LnGrp Delay(d),s/veh          | 55.2                                                                              | 0.0                                                                               | 29.1                                                                              | 43.5                                                                              | 26.8                                                                              | 26.2                                                                              | 48.9                                                                              | 16.0                                                                              | 9.7                                                                               | 58.6                                                                                | 20.1                                                                                | 10.3                                                                                |
| LnGrp LOS                     | E                                                                                 |                                                                                   | C                                                                                 | D                                                                                 | C                                                                                 | C                                                                                 | D                                                                                 | B                                                                                 | A                                                                                 | E                                                                                   | C                                                                                   | B                                                                                   |
| Approach Vol, veh/h           | 78                                                                                |                                                                                   |                                                                                   |                                                                                   | 147                                                                               |                                                                                   |                                                                                   |                                                                                   | 767                                                                               |                                                                                     | 836                                                                                 |                                                                                     |
| Approach Delay, s/veh         | 45.5                                                                              |                                                                                   |                                                                                   |                                                                                   | 37.9                                                                              |                                                                                   |                                                                                   |                                                                                   | 18.5                                                                              |                                                                                     | 21.9                                                                                |                                                                                     |
| Approach LOS                  | D                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                     | C                                                                                   |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 7.3                                                                               | 42.8                                                                              | 10.5                                                                              | 15.1                                                                              | 8.6                                                                               | 41.5                                                                              | 7.7                                                                               | 17.9                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.3), s | 13.8                                                                              | 23.5                                                                              | 6.1                                                                               | 3.1                                                                               | 4.7                                                                               | 30.1                                                                              | 4.1                                                                               | 3.5                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.1                                                                               | 5.3                                                                               | 0.2                                                                               | 0.1                                                                               | 0.1                                                                               | 6.4                                                                               | 0.1                                                                               | 0.1                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           |                                                                                   |                                                                                   | 22.8                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 4: Honoapiilani Highway & Lower Honoapiilani Road

10/05/2017

|                               |                                                                                    |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                    |                                                                                     |                                                                                     |
|-------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                    |                                                                                     |                                                                                     |
| Movement                      | EBL                                                                                | EBT                                                                               | EBR                                                                               | WBL  | WBT                                                                               | WBR  | NBL                                                                               | NBT                                                                               | NBR  | SBL                                                                                | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                    |  |  |      |  |      |  |  |      |  |  |  |
| Traffic Volume (veh/h)        | 35                                                                                 | 10                                                                                | 480                                                                               | 20   | 5                                                                                 | 0    | 315                                                                               | 730                                                                               | 45   | 10                                                                                 | 885                                                                                 | 15                                                                                  |
| Future Volume (veh/h)         | 35                                                                                 | 10                                                                                | 480                                                                               | 20   | 5                                                                                 | 0    | 315                                                                               | 730                                                                               | 45   | 10                                                                                 | 885                                                                                 | 15                                                                                  |
| Number                        | 3                                                                                  | 8                                                                                 | 18                                                                                | 7    | 4                                                                                 | 14   | 1                                                                                 | 6                                                                                 | 16   | 5                                                                                  | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                  | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                  | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 0.99                                                                               |                                                                                   | 1.00                                                                              | 0.99 |                                                                                   | 1.00 | 1.00                                                                              |                                                                                   | 1.00 | 1.00                                                                               |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                               | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                               | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 38                                                                                 | 11                                                                                | 0                                                                                 | 22   | 5                                                                                 | 0    | 342                                                                               | 793                                                                               | 48   | 11                                                                                 | 962                                                                                 | 6                                                                                   |
| Adj No. of Lanes              | 0                                                                                  | 1                                                                                 | 1                                                                                 | 0    | 1                                                                                 | 0    | 1                                                                                 | 2                                                                                 | 0    | 1                                                                                  | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                               | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                  | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                  | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 186                                                                                | 30                                                                                | 114                                                                               | 191  | 30                                                                                | 0    | 407                                                                               | 2272                                                                              | 138  | 15                                                                                 | 1589                                                                                | 711                                                                                 |
| Arrive On Green               | 0.09                                                                               | 0.07                                                                              | 0.00                                                                              | 0.09 | 0.07                                                                              | 0.00 | 0.23                                                                              | 0.67                                                                              | 0.67 | 0.01                                                                               | 0.45                                                                                | 0.45                                                                                |
| Sat Flow, veh/h               | 1111                                                                               | 420                                                                               | 1583                                                                              | 1149 | 419                                                                               | 0    | 1774                                                                              | 3391                                                                              | 205  | 1774                                                                               | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h          | 49                                                                                 | 0                                                                                 | 0                                                                                 | 27   | 0                                                                                 | 0    | 342                                                                               | 414                                                                               | 427  | 11                                                                                 | 962                                                                                 | 6                                                                                   |
| Grp Sat Flow(s),veh/h/ln      | 1531                                                                               | 0                                                                                 | 1583                                                                              | 1568 | 0                                                                                 | 0    | 1774                                                                              | 1770                                                                              | 1827 | 1774                                                                               | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s               | 0.9                                                                                | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0  | 11.1                                                                              | 6.0                                                                               | 6.0  | 0.4                                                                                | 12.3                                                                                | 0.1                                                                                 |
| Cycle Q Clear(g_c), s         | 1.7                                                                                | 0.0                                                                               | 0.0                                                                               | 0.8  | 0.0                                                                               | 0.0  | 11.1                                                                              | 6.0                                                                               | 6.0  | 0.4                                                                                | 12.3                                                                                | 0.1                                                                                 |
| Prop In Lane                  | 0.78                                                                               |                                                                                   | 1.00                                                                              | 0.81 |                                                                                   | 0.00 | 1.00                                                                              |                                                                                   | 0.11 | 1.00                                                                               |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 242                                                                                | 0                                                                                 | 114                                                                               | 247  | 0                                                                                 | 0    | 407                                                                               | 1186                                                                              | 1224 | 15                                                                                 | 1589                                                                                | 711                                                                                 |
| V/C Ratio(X)                  | 0.20                                                                               | 0.00                                                                              | 0.00                                                                              | 0.11 | 0.00                                                                              | 0.00 | 0.84                                                                              | 0.35                                                                              | 0.35 | 0.74                                                                               | 0.61                                                                                | 0.01                                                                                |
| Avail Cap(c_a), veh/h         | 875                                                                                | 0                                                                                 | 791                                                                               | 799  | 0                                                                                 | 0    | 2098                                                                              | 1680                                                                              | 1734 | 2098                                                                               | 3360                                                                                | 1503                                                                                |
| HCM Platoon Ratio             | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                               | 0.00                                                                              | 0.00                                                                              | 1.00 | 0.00                                                                              | 0.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 26.2                                                                               | 0.0                                                                               | 0.0                                                                               | 25.9 | 0.0                                                                               | 0.0  | 22.1                                                                              | 4.3                                                                               | 4.3  | 29.7                                                                               | 12.5                                                                                | 9.1                                                                                 |
| Incr Delay (d2), s/veh        | 0.4                                                                                | 0.0                                                                               | 0.0                                                                               | 0.2  | 0.0                                                                               | 0.0  | 1.8                                                                               | 0.4                                                                               | 0.4  | 23.1                                                                               | 0.8                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                                | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 0.8                                                                                | 0.0                                                                               | 0.0                                                                               | 0.4  | 0.0                                                                               | 0.0  | 5.6                                                                               | 3.0                                                                               | 3.1  | 0.3                                                                                | 6.2                                                                                 | 0.1                                                                                 |
| LnGrp Delay(d),s/veh          | 26.6                                                                               | 0.0                                                                               | 0.0                                                                               | 26.1 | 0.0                                                                               | 0.0  | 23.9                                                                              | 4.6                                                                               | 4.6  | 52.8                                                                               | 13.3                                                                                | 9.2                                                                                 |
| LnGrp LOS                     | C                                                                                  |                                                                                   |                                                                                   | C    |                                                                                   |      | C                                                                                 | A                                                                                 | A    | D                                                                                  | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h           | 49                                                                                 |                                                                                   |                                                                                   |      | 27                                                                                |      |                                                                                   |                                                                                   | 1183 |                                                                                    | 979                                                                                 |                                                                                     |
| Approach Delay, s/veh         | 26.6                                                                               |                                                                                   |                                                                                   |      | 26.1                                                                              |      |                                                                                   |                                                                                   | 10.2 |                                                                                    | 13.7                                                                                |                                                                                     |
| Approach LOS                  | C                                                                                  |                                                                                   |                                                                                   |      | C                                                                                 |      |                                                                                   |                                                                                   | B    |                                                                                    | B                                                                                   |                                                                                     |
| Timer                         | 1                                                                                  | 2                                                                                 | 3                                                                                 | 4    | 5                                                                                 | 6    | 7                                                                                 | 8                                                                                 |      |                                                                                    |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                  | 2                                                                                 |                                                                                   |      | 4                                                                                 | 5    | 6                                                                                 | 8                                                                                 |      |                                                                                    |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 17.8                                                                               | 33.0                                                                              |                                                                                   |      | 9.3                                                                               | 4.5  | 46.2                                                                              | 9.3                                                                               |      |                                                                                    |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                                | 6.0                                                                               |                                                                                   |      | 5.0                                                                               | 4.0  | 6.0                                                                               | 5.0                                                                               |      |                                                                                    |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 1.0                                                                                | 57.0                                                                              |                                                                                   |      | 27.0                                                                              | 71.0 | 57.0                                                                              | 30.0                                                                              |      |                                                                                    |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.0), s | 14.3                                                                               | 14.3                                                                              |                                                                                   |      | 2.8                                                                               | 2.4  | 8.0                                                                               | 3.7                                                                               |      |                                                                                    |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.8                                                                                | 12.6                                                                              |                                                                                   |      | 0.1                                                                               | 0.0  | 9.7                                                                               | 0.1                                                                               |      |                                                                                    |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                    |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                    |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           |                                                                                    |                                                                                   | 12.3                                                                              |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                    |                                                                                     |                                                                                     |
| HCM 2010 LOS                  |                                                                                    |                                                                                   | B                                                                                 |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                    |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 5: Honoapiilani Highway & Kai Malina Parkway/Halawai Drive

10/05/2017

|                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|--------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                       | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations            |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)         | 35                                                                                | 0                                                                                 | 70                                                                                | 10                                                                                | 5                                                                                 | 10                                                                                | 135                                                                               | 1140                                                                              | 20                                                                                | 15                                                                                  | 1350                                                                                | 70                                                                                  |
| Future Volume (veh/h)          | 35                                                                                | 0                                                                                 | 70                                                                                | 10                                                                                | 5                                                                                 | 10                                                                                | 135                                                                               | 1140                                                                              | 20                                                                                | 15                                                                                  | 1350                                                                                | 70                                                                                  |
| Number                         | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)            | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln         | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h           | 38                                                                                | 0                                                                                 | 1                                                                                 | 11                                                                                | 5                                                                                 | 1                                                                                 | 147                                                                               | 1239                                                                              | 21                                                                                | 16                                                                                  | 1467                                                                                | 47                                                                                  |
| Adj No. of Lanes               | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor               | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %           | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                     | 174                                                                               | 0                                                                                 | 74                                                                                | 114                                                                               | 22                                                                                | 3                                                                                 | 185                                                                               | 2656                                                                              | 45                                                                                | 20                                                                                  | 2311                                                                                | 1034                                                                                |
| Arrive On Green                | 0.06                                                                              | 0.00                                                                              | 0.05                                                                              | 0.06                                                                              | 0.05                                                                              | 0.05                                                                              | 0.10                                                                              | 0.75                                                                              | 0.75                                                                              | 0.01                                                                                | 0.65                                                                                | 0.65                                                                                |
| Sat Flow, veh/h                | 1552                                                                              | 0                                                                                 | 1583                                                                              | 656                                                                               | 462                                                                               | 70                                                                                | 1774                                                                              | 3561                                                                              | 60                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h           | 38                                                                                | 0                                                                                 | 1                                                                                 | 17                                                                                | 0                                                                                 | 0                                                                                 | 147                                                                               | 615                                                                               | 645                                                                               | 16                                                                                  | 1467                                                                                | 47                                                                                  |
| Grp Sat Flow(s),veh/h/ln       | 1552                                                                              | 0                                                                                 | 1583                                                                              | 1188                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                              | 1770                                                                              | 1852                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s                | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.3                                                                               | 0.0                                                                               | 0.0                                                                               | 5.8                                                                               | 9.7                                                                               | 9.7                                                                               | 0.6                                                                                 | 17.6                                                                                | 0.8                                                                                 |
| Cycle Q Clear(g_c), s          | 1.5                                                                               | 0.0                                                                               | 0.0                                                                               | 1.7                                                                               | 0.0                                                                               | 0.0                                                                               | 5.8                                                                               | 9.7                                                                               | 9.7                                                                               | 0.6                                                                                 | 17.6                                                                                | 0.8                                                                                 |
| Prop In Lane                   | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.65                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                              |                                                                                   | 0.03                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h         | 195                                                                               | 0                                                                                 | 74                                                                                | 155                                                                               | 0                                                                                 | 0                                                                                 | 185                                                                               | 1320                                                                              | 1381                                                                              | 20                                                                                  | 2311                                                                                | 1034                                                                                |
| V/C Ratio(X)                   | 0.19                                                                              | 0.00                                                                              | 0.01                                                                              | 0.11                                                                              | 0.00                                                                              | 0.00                                                                              | 0.79                                                                              | 0.47                                                                              | 0.47                                                                              | 0.79                                                                                | 0.63                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h          | 581                                                                               | 0                                                                                 | 510                                                                               | 576                                                                               | 0                                                                                 | 0                                                                                 | 521                                                                               | 2130                                                                              | 2229                                                                              | 273                                                                                 | 3764                                                                                | 1684                                                                                |
| HCM Platoon Ratio              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)             | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh       | 32.7                                                                              | 0.0                                                                               | 32.5                                                                              | 32.8                                                                              | 0.0                                                                               | 0.0                                                                               | 31.3                                                                              | 3.5                                                                               | 3.5                                                                               | 35.2                                                                                | 7.4                                                                                 | 4.4                                                                                 |
| Incr Delay (d2), s/veh         | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 2.9                                                                               | 0.6                                                                               | 0.5                                                                               | 21.7                                                                                | 0.6                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh      | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln       | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 0.3                                                                               | 0.0                                                                               | 0.0                                                                               | 3.0                                                                               | 4.8                                                                               | 5.0                                                                               | 0.4                                                                                 | 8.6                                                                                 | 0.3                                                                                 |
| LnGrp Delay(d),s/veh           | 32.8                                                                              | 0.0                                                                               | 32.5                                                                              | 32.9                                                                              | 0.0                                                                               | 0.0                                                                               | 34.2                                                                              | 4.1                                                                               | 4.1                                                                               | 56.9                                                                                | 8.0                                                                                 | 4.5                                                                                 |
| LnGrp LOS                      | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 | A                                                                                 | A                                                                                 | E                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h            |                                                                                   | 39                                                                                |                                                                                   |                                                                                   | 17                                                                                |                                                                                   |                                                                                   | 1407                                                                              |                                                                                   |                                                                                     | 1530                                                                                |                                                                                     |
| Approach Delay, s/veh          |                                                                                   | 32.8                                                                              |                                                                                   |                                                                                   | 32.9                                                                              |                                                                                   |                                                                                   | 7.2                                                                               |                                                                                   |                                                                                     | 8.4                                                                                 |                                                                                     |
| Approach LOS                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |
| Timer                          | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                   | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s       | 11.5                                                                              | 51.7                                                                              |                                                                                   | 8.4                                                                               | 4.8                                                                               | 58.3                                                                              |                                                                                   | 8.4                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s        | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s    | 21.0                                                                              | 76.0                                                                              |                                                                                   | 23.0                                                                              | 11.0                                                                              | 86.0                                                                              |                                                                                   | 23.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+17.8), s | 17.8                                                                              | 19.6                                                                              |                                                                                   | 3.7                                                                               | 2.6                                                                               | 11.7                                                                              |                                                                                   | 3.5                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s        | 0.1                                                                               | 27.1                                                                              |                                                                                   | 0.0                                                                               | 0.0                                                                               | 20.0                                                                              |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay            |                                                                                   |                                                                                   | 8.3                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                   |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 6: Honoapiilani Highway & Kai Ala Drive/Puukolii Road

10/05/2017

|                               | <div></div> |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                      | EBL                                                                                           | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR  | NBL                                                                               | NBT                                                                               | NBR                                                                                | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                               |  |  |  |  |      |  |  |  |  |  |  |
| Traffic Volume (veh/h)        | 55                                                                                            | 5                                                                                 | 35                                                                                | 40                                                                                | 15                                                                                | 50   | 110                                                                               | 1280                                                                              | 60                                                                                 | 30                                                                                  | 1295                                                                                | 45                                                                                  |
| Future Volume (veh/h)         | 55                                                                                            | 5                                                                                 | 35                                                                                | 40                                                                                | 15                                                                                | 50   | 110                                                                               | 1280                                                                              | 60                                                                                 | 30                                                                                  | 1295                                                                                | 45                                                                                  |
| Number                        | 3                                                                                             | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14   | 1                                                                                 | 6                                                                                 | 16                                                                                 | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                             | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                                          |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00 | 1.00                                                                              |                                                                                   | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                                          | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                                          | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 60                                                                                            | 5                                                                                 | 1                                                                                 | 43                                                                                | 16                                                                                | 1    | 120                                                                               | 1391                                                                              | 49                                                                                 | 33                                                                                  | 1408                                                                                | 35                                                                                  |
| Adj No. of Lanes              | 0                                                                                             | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0    | 1                                                                                 | 2                                                                                 | 1                                                                                  | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                                          | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                             | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 160                                                                                           | 12                                                                                | 153                                                                               | 111                                                                               | 168                                                                               | 10   | 142                                                                               | 2768                                                                              | 1238                                                                               | 43                                                                                  | 2571                                                                                | 1150                                                                                |
| Arrive On Green               | 0.10                                                                                          | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.10 | 0.08                                                                              | 0.78                                                                              | 0.78                                                                               | 0.02                                                                                | 0.73                                                                                | 0.73                                                                                |
| Sat Flow, veh/h               | 1193                                                                                          | 120                                                                               | 1578                                                                              | 1401                                                                              | 1735                                                                              | 108  | 1774                                                                              | 3539                                                                              | 1583                                                                               | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h          | 65                                                                                            | 0                                                                                 | 1                                                                                 | 43                                                                                | 0                                                                                 | 17   | 120                                                                               | 1391                                                                              | 49                                                                                 | 33                                                                                  | 1408                                                                                | 35                                                                                  |
| Grp Sat Flow(s),veh/h/ln      | 1313                                                                                          | 0                                                                                 | 1578                                                                              | 1401                                                                              | 0                                                                                 | 1843 | 1774                                                                              | 1770                                                                              | 1583                                                                               | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s               | 6.6                                                                                           | 0.0                                                                               | 0.1                                                                               | 4.7                                                                               | 0.0                                                                               | 1.3  | 10.3                                                                              | 21.9                                                                              | 1.1                                                                                | 2.9                                                                                 | 28.0                                                                                | 1.0                                                                                 |
| Cycle Q Clear(g_c), s         | 7.9                                                                                           | 0.0                                                                               | 0.1                                                                               | 12.5                                                                              | 0.0                                                                               | 1.3  | 10.3                                                                              | 21.9                                                                              | 1.1                                                                                | 2.9                                                                                 | 28.0                                                                                | 1.0                                                                                 |
| Prop In Lane                  | 0.92                                                                                          |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.06 | 1.00                                                                              |                                                                                   | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 172                                                                                           | 0                                                                                 | 153                                                                               | 111                                                                               | 0                                                                                 | 178  | 142                                                                               | 2768                                                                              | 1238                                                                               | 43                                                                                  | 2571                                                                                | 1150                                                                                |
| V/C Ratio(X)                  | 0.38                                                                                          | 0.00                                                                              | 0.01                                                                              | 0.39                                                                              | 0.00                                                                              | 0.10 | 0.85                                                                              | 0.50                                                                              | 0.04                                                                               | 0.76                                                                                | 0.55                                                                                | 0.03                                                                                |
| Avail Cap(c_a), veh/h         | 254                                                                                           | 0                                                                                 | 244                                                                               | 192                                                                               | 0                                                                                 | 285  | 240                                                                               | 2768                                                                              | 1238                                                                               | 240                                                                                 | 2571                                                                                | 1150                                                                                |
| HCM Platoon Ratio             | 1.00                                                                                          | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                                          | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00 | 0.72                                                                              | 0.72                                                                              | 0.72                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 67.3                                                                                          | 0.0                                                                               | 63.3                                                                              | 72.8                                                                              | 0.0                                                                               | 63.8 | 70.4                                                                              | 6.1                                                                               | 3.8                                                                                | 75.2                                                                                | 9.6                                                                                 | 5.9                                                                                 |
| Incr Delay (d2), s/veh        | 1.4                                                                                           | 0.0                                                                               | 0.0                                                                               | 2.2                                                                               | 0.0                                                                               | 0.2  | 3.8                                                                               | 0.5                                                                               | 0.0                                                                                | 9.7                                                                                 | 0.8                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                                           | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 2.7                                                                                           | 0.0                                                                               | 0.0                                                                               | 1.9                                                                               | 0.0                                                                               | 0.7  | 5.2                                                                               | 10.8                                                                              | 0.5                                                                                | 1.5                                                                                 | 13.8                                                                                | 0.4                                                                                 |
| LnGrp Delay(d),s/veh          | 68.7                                                                                          | 0.0                                                                               | 63.3                                                                              | 75.0                                                                              | 0.0                                                                               | 64.1 | 74.1                                                                              | 6.5                                                                               | 3.8                                                                                | 84.8                                                                                | 10.5                                                                                | 6.0                                                                                 |
| LnGrp LOS                     | E                                                                                             |                                                                                   | E                                                                                 | E                                                                                 |                                                                                   | E    | E                                                                                 | A                                                                                 | A                                                                                  | F                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h           | 66                                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 60   |                                                                                   | 1560                                                                              |                                                                                    | 1476                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 68.6                                                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 71.9 |                                                                                   | 11.6                                                                              |                                                                                    | 12.0                                                                                |                                                                                     |                                                                                     |
| Approach LOS                  | E                                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   | E    |                                                                                   | B                                                                                 |                                                                                    | B                                                                                   |                                                                                     |                                                                                     |
| Timer                         | 1                                                                                             | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6    | 7                                                                                 | 8                                                                                 |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                             | 2                                                                                 |                                                                                   |                                                                                   | 4                                                                                 | 5    | 6                                                                                 | 8                                                                                 |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 16.4                                                                                          | 118.6                                                                             |                                                                                   |                                                                                   | 20.0                                                                              | 7.8  | 127.2                                                                             | 20.0                                                                              |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                                           | 6.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 4.0  | 6.0                                                                               | 5.0                                                                               |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 21.0                                                                                          | 95.0                                                                              |                                                                                   |                                                                                   | 24.0                                                                              | 21.0 | 95.0                                                                              | 24.0                                                                              |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1/3), s | 12.3                                                                                          | 30.0                                                                              |                                                                                   |                                                                                   | 14.5                                                                              | 4.9  | 23.9                                                                              | 9.9                                                                               |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.1                                                                                           | 26.5                                                                              |                                                                                   |                                                                                   | 0.1                                                                               | 0.0  | 27.1                                                                              | 0.1                                                                               |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           |                                                                                               |                                                                                   | 14.2                                                                              |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  |                                                                                               |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 7: Honoapiilani Highway & Kaanapali Parkway/Halelo Street

10/05/2017

|                               |                                                                                    |       |      |      |      |       |      |      |      |      |      |      |
|-------------------------------|------------------------------------------------------------------------------------|-------|------|------|------|-------|------|------|------|------|------|------|
|                               |  |       |      |      |      |       |      |      |      |      |      |      |
| Movement                      | EBL                                                                                | EBT   | EBR  | WBL  | WBT  | WBR   | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations           |                                                                                    |       |      |      |      |       |      |      |      |      |      |      |
| Traffic Volume (veh/h)        | 140                                                                                | 10    | 220  | 10   | 10   | 10    | 425  | 1355 | 15   | 85   | 1245 | 100  |
| Future Volume (veh/h)         | 140                                                                                | 10    | 220  | 10   | 10   | 10    | 425  | 1355 | 15   | 85   | 1245 | 100  |
| Number                        | 3                                                                                  | 8     | 18   | 7    | 4    | 14    | 1    | 6    | 16   | 5    | 2    | 12   |
| Initial Q (Qb), veh           | 0                                                                                  | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                               |       | 0.97 | 1.00 |      | 0.98  | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Parking Bus, Adj              | 1.00                                                                               | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln        | 1863                                                                               | 1863  | 1863 | 1900 | 1863 | 1900  | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h          | 160                                                                                | 0     | 62   | 11   | 11   | 3     | 462  | 1473 | 16   | 92   | 1353 | 80   |
| Adj No. of Lanes              | 2                                                                                  | 0     | 2    | 0    | 1    | 0     | 2    | 2    | 0    | 1    | 2    | 1    |
| Peak Hour Factor              | 0.92                                                                               | 0.92  | 0.92 | 0.92 | 0.92 | 0.92  | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, %          | 2                                                                                  | 2     | 2    | 2    | 2    | 2     | 2    | 2    | 2    | 2    | 2    | 2    |
| Cap, veh/h                    | 334                                                                                | 0     | 820  | 61   | 61   | 17    | 606  | 2130 | 23   | 155  | 1787 | 931  |
| Arrive On Green               | 0.09                                                                               | 0.00  | 0.09 | 0.08 | 0.08 | 0.05  | 0.18 | 0.59 | 0.58 | 0.09 | 0.50 | 0.50 |
| Sat Flow, veh/h               | 3548                                                                               | 0     | 3074 | 783  | 783  | 214   | 3442 | 3587 | 39   | 1774 | 3539 | 1578 |
| Grp Volume(v), veh/h          | 160                                                                                | 0     | 62   | 25   | 0    | 0     | 462  | 726  | 763  | 92   | 1353 | 80   |
| Grp Sat Flow(s),veh/h/ln      | 1774                                                                               | 0     | 1537 | 1780 | 0    | 0     | 1721 | 1770 | 1856 | 1774 | 1770 | 1578 |
| Q Serve(g_s), s               | 4.7                                                                                | 0.0   | 1.7  | 1.4  | 0.0  | 0.0   | 13.9 | 30.9 | 30.9 | 5.5  | 33.5 | 2.4  |
| Cycle Q Clear(g_c), s         | 4.7                                                                                | 0.0   | 1.7  | 1.4  | 0.0  | 0.0   | 13.9 | 30.9 | 30.9 | 5.5  | 33.5 | 2.4  |
| Prop In Lane                  | 1.00                                                                               |       | 1.00 | 0.44 |      | 0.12  | 1.00 |      | 0.02 | 1.00 |      | 1.00 |
| Lane Grp Cap(c), veh/h        | 334                                                                                | 0     | 820  | 139  | 0    | 0     | 606  | 1051 | 1102 | 155  | 1787 | 931  |
| V/C Ratio(X)                  | 0.48                                                                               | 0.00  | 0.08 | 0.18 | 0.00 | 0.00  | 0.76 | 0.69 | 0.69 | 0.60 | 0.76 | 0.09 |
| Avail Cap(c_a), veh/h         | 1105                                                                               | 0     | 1487 | 505  | 0    | 0     | 1829 | 3145 | 3298 | 244  | 4896 | 2317 |
| HCM Platoon Ratio             | 1.00                                                                               | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I)            | 1.00                                                                               | 0.00  | 1.00 | 1.00 | 0.00 | 0.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh      | 46.9                                                                               | 0.0   | 30.4 | 47.2 | 0.0  | 0.0   | 42.8 | 15.3 | 15.3 | 48.0 | 21.7 | 9.7  |
| Incr Delay (d2), s/veh        | 0.4                                                                                | 0.0   | 0.0  | 0.6  | 0.0  | 0.0   | 0.8  | 1.2  | 1.1  | 1.4  | 1.0  | 0.1  |
| Initial Q Delay(d3),s/veh     | 0.0                                                                                | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln      | 2.3                                                                                | 0.0   | 0.7  | 0.7  | 0.0  | 0.0   | 6.7  | 15.3 | 16.0 | 2.7  | 16.4 | 1.3  |
| LnGrp Delay(d),s/veh          | 47.3                                                                               | 0.0   | 30.4 | 47.8 | 0.0  | 0.0   | 43.5 | 16.4 | 16.4 | 49.3 | 22.6 | 9.7  |
| LnGrp LOS                     | D                                                                                  |       | C    | D    |      |       | D    | B    | B    | D    | C    | A    |
| Approach Vol, veh/h           | 222                                                                                |       |      | 25   |      |       | 1951 |      |      | 1525 |      |      |
| Approach Delay, s/veh         | 42.6                                                                               |       |      | 47.8 |      |       | 22.8 |      |      | 23.6 |      |      |
| Approach LOS                  | D                                                                                  |       |      | D    |      |       | C    |      |      | C    |      |      |
| Timer                         | 1                                                                                  | 2     | 3    | 4    | 5    | 6     | 7    | 8    |      |      |      |      |
| Assigned Phs                  | 1                                                                                  | 2     |      | 4    | 5    | 6     |      | 8    |      |      |      |      |
| Phs Duration (G+Y+Rc), s      | 23.2                                                                               | 59.1  |      | 12.5 | 13.5 | 68.8  |      | 14.3 |      |      |      |      |
| Change Period (Y+Rc), s       | 6.0                                                                                | 6.0   |      | 7.0  | 6.0  | 6.0   |      | 7.0  |      |      |      |      |
| Max Green Setting (Gmax), s   | 50.0                                                                               | 149.0 |      | 28.0 | 13.0 | 192.0 |      | 31.0 |      |      |      |      |
| Max Q Clear Time (g_c+1.5), s | 15.9                                                                               | 35.5  |      | 3.4  | 7.5  | 32.9  |      | 6.7  |      |      |      |      |
| Green Ext Time (p_c), s       | 1.3                                                                                | 17.7  |      | 0.0  | 0.1  | 17.8  |      | 0.6  |      |      |      |      |
| Intersection Summary          |                                                                                    |       |      |      |      |       |      |      |      |      |      |      |
| HCM 2010 Ctrl Delay           | 24.5                                                                               |       |      |      |      |       |      |      |      |      |      |      |
| HCM 2010 LOS                  | C                                                                                  |       |      |      |      |       |      |      |      |      |      |      |
| Notes                         |                                                                                    |       |      |      |      |       |      |      |      |      |      |      |

# HCM 2010 Signalized Intersection Summary

## 8: Honoapiilani Highway & Leialii Parkway

10/05/2017

|                               |  |                                                                                   |      |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
|-------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------|
| Movement                      | EBL                                                                                | EBT                                                                               | EBR  | WBL                                                                               | WBT                                                                               | WBR   | NBL                                                                               | NBT                                                                               | NBR  | SBL                                                                                 | SBT                                                                                 | SBR  |
| Lane Configurations           |                                                                                    |  |      |  |  |       |  |  |      |  |  |      |
| Traffic Volume (veh/h)        | 5                                                                                  | 5                                                                                 | 5    | 60                                                                                | 0                                                                                 | 45    | 5                                                                                 | 1790                                                                              | 90   | 30                                                                                  | 1445                                                                                | 5    |
| Future Volume (veh/h)         | 5                                                                                  | 5                                                                                 | 5    | 60                                                                                | 0                                                                                 | 45    | 5                                                                                 | 1790                                                                              | 90   | 30                                                                                  | 1445                                                                                | 5    |
| Number                        | 3                                                                                  | 8                                                                                 | 18   | 7                                                                                 | 4                                                                                 | 14    | 1                                                                                 | 6                                                                                 | 16   | 5                                                                                   | 2                                                                                   | 12   |
| Initial Q (Qb), veh           | 0                                                                                  | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0     | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   | 0                                                                                   | 0    |
| Ped-Bike Adj(A_pbT)           | 0.98                                                                               |                                                                                   | 0.97 | 0.98                                                                              |                                                                                   | 0.97  | 1.00                                                                              |                                                                                   | 1.00 | 1.00                                                                                |                                                                                     | 1.00 |
| Parking Bus, Adj              | 1.00                                                                               | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00  | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00 |
| Adj Sat Flow, veh/h/ln        | 1900                                                                               | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1900  | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                                | 1863                                                                                | 1900 |
| Adj Flow Rate, veh/h          | 5                                                                                  | 5                                                                                 | 1    | 65                                                                                | 0                                                                                 | 1     | 5                                                                                 | 1946                                                                              | 96   | 33                                                                                  | 1571                                                                                | 5    |
| Adj No. of Lanes              | 0                                                                                  | 1                                                                                 | 0    | 1                                                                                 | 1                                                                                 | 0     | 1                                                                                 | 2                                                                                 | 0    | 1                                                                                   | 2                                                                                   | 0    |
| Peak Hour Factor              | 0.92                                                                               | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92  | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                                | 0.92                                                                                | 0.92 |
| Percent Heavy Veh, %          | 2                                                                                  | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2     | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                   | 2                                                                                   | 2    |
| Cap, veh/h                    | 90                                                                                 | 80                                                                                | 13   | 176                                                                               | 0                                                                                 | 138   | 11                                                                                | 2710                                                                              | 133  | 63                                                                                  | 2962                                                                                | 9    |
| Arrive On Green               | 0.09                                                                               | 0.09                                                                              | 0.08 | 0.09                                                                              | 0.00                                                                              | 0.08  | 0.01                                                                              | 0.79                                                                              | 0.78 | 0.04                                                                                | 0.82                                                                                | 0.81 |
| Sat Flow, veh/h               | 584                                                                                | 895                                                                               | 148  | 1372                                                                              | 0                                                                                 | 1543  | 1774                                                                              | 3434                                                                              | 168  | 1774                                                                                | 3619                                                                                | 12   |
| Grp Volume(v), veh/h          | 11                                                                                 | 0                                                                                 | 0    | 65                                                                                | 0                                                                                 | 1     | 5                                                                                 | 995                                                                               | 1047 | 33                                                                                  | 768                                                                                 | 808  |
| Grp Sat Flow(s),veh/h/ln      | 1627                                                                               | 0                                                                                 | 0    | 1372                                                                              | 0                                                                                 | 1543  | 1774                                                                              | 1770                                                                              | 1833 | 1774                                                                                | 1770                                                                                | 1861 |
| Q Serve(g_s), s               | 0.0                                                                                | 0.0                                                                               | 0.0  | 5.4                                                                               | 0.0                                                                               | 0.1   | 0.4                                                                               | 37.9                                                                              | 39.4 | 2.6                                                                                 | 19.5                                                                                | 19.5 |
| Cycle Q Clear(g_c), s         | 0.8                                                                                | 0.0                                                                               | 0.0  | 6.1                                                                               | 0.0                                                                               | 0.1   | 0.4                                                                               | 37.9                                                                              | 39.4 | 2.6                                                                                 | 19.5                                                                                | 19.5 |
| Prop In Lane                  | 0.45                                                                               |                                                                                   | 0.09 | 1.00                                                                              |                                                                                   | 1.00  | 1.00                                                                              |                                                                                   | 0.09 | 1.00                                                                                |                                                                                     | 0.01 |
| Lane Grp Cap(c), veh/h        | 183                                                                                | 0                                                                                 | 0    | 176                                                                               | 0                                                                                 | 138   | 11                                                                                | 1396                                                                              | 1446 | 63                                                                                  | 1448                                                                                | 1523 |
| V/C Ratio(X)                  | 0.06                                                                               | 0.00                                                                              | 0.00 | 0.37                                                                              | 0.00                                                                              | 0.01  | 0.45                                                                              | 0.71                                                                              | 0.72 | 0.52                                                                                | 0.53                                                                                | 0.53 |
| Avail Cap(c_a), veh/h         | 312                                                                                | 0                                                                                 | 0    | 289                                                                               | 0                                                                                 | 265   | 101                                                                               | 1396                                                                              | 1446 | 101                                                                                 | 1448                                                                                | 1523 |
| HCM Platoon Ratio             | 1.00                                                                               | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00  | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00 |
| Upstream Filter(I)            | 1.00                                                                               | 0.00                                                                              | 0.00 | 1.00                                                                              | 0.00                                                                              | 1.00  | 0.61                                                                              | 0.61                                                                              | 0.61 | 1.00                                                                                | 1.00                                                                                | 1.00 |
| Uniform Delay (d), s/veh      | 58.4                                                                               | 0.0                                                                               | 0.0  | 60.7                                                                              | 0.0                                                                               | 58.5  | 69.3                                                                              | 7.1                                                                               | 7.3  | 66.3                                                                                | 4.1                                                                                 | 4.1  |
| Incr Delay (d2), s/veh        | 0.1                                                                                | 0.0                                                                               | 0.0  | 1.3                                                                               | 0.0                                                                               | 0.0   | 6.2                                                                               | 1.9                                                                               | 2.0  | 2.5                                                                                 | 1.4                                                                                 | 1.3  |
| Initial Q Delay(d3),s/veh     | 0.0                                                                                | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0   | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                                 | 0.0                                                                                 | 0.0  |
| %ile BackOfQ(50%),veh/ln      | 0.4                                                                                | 0.0                                                                               | 0.0  | 2.5                                                                               | 0.0                                                                               | 0.0   | 0.2                                                                               | 19.0                                                                              | 20.3 | 1.3                                                                                 | 9.9                                                                                 | 10.4 |
| LnGrp Delay(d),s/veh          | 58.6                                                                               | 0.0                                                                               | 0.0  | 62.0                                                                              | 0.0                                                                               | 58.6  | 75.6                                                                              | 9.0                                                                               | 9.3  | 68.8                                                                                | 5.5                                                                                 | 5.4  |
| LnGrp LOS                     | E                                                                                  |                                                                                   |      | E                                                                                 |                                                                                   | E     | E                                                                                 | A                                                                                 | A    | E                                                                                   | A                                                                                   | A    |
| Approach Vol, veh/h           | 11                                                                                 |                                                                                   |      | 66                                                                                |                                                                                   |       | 2047                                                                              |                                                                                   |      | 1609                                                                                |                                                                                     |      |
| Approach Delay, s/veh         | 58.6                                                                               |                                                                                   |      | 62.0                                                                              |                                                                                   |       | 9.3                                                                               |                                                                                   |      | 6.7                                                                                 |                                                                                     |      |
| Approach LOS                  | E                                                                                  |                                                                                   |      | E                                                                                 |                                                                                   |       | A                                                                                 |                                                                                   |      | A                                                                                   |                                                                                     |      |
| Timer                         | 1                                                                                  | 2                                                                                 | 3    | 4                                                                                 | 5                                                                                 | 6     | 7                                                                                 | 8                                                                                 |      |                                                                                     |                                                                                     |      |
| Assigned Phs                  | 1                                                                                  | 2                                                                                 |      | 4                                                                                 | 5                                                                                 | 6     |                                                                                   | 8                                                                                 |      |                                                                                     |                                                                                     |      |
| Phs Duration (G+Y+Rc), s      | 4.9                                                                                | 118.6                                                                             |      | 16.5                                                                              | 9.0                                                                               | 114.5 |                                                                                   | 16.5                                                                              |      |                                                                                     |                                                                                     |      |
| Change Period (Y+Rc), s       | 4.0                                                                                | 5.0                                                                               |      | 5.0                                                                               | 4.0                                                                               | 5.0   |                                                                                   | 5.0                                                                               |      |                                                                                     |                                                                                     |      |
| Max Green Setting (Gmax), s   | 95.0                                                                               | 95.0                                                                              |      | 23.0                                                                              | 8.0                                                                               | 95.0  |                                                                                   | 23.0                                                                              |      |                                                                                     |                                                                                     |      |
| Max Q Clear Time (g_c+1/4), s | 12.4                                                                               | 21.5                                                                              |      | 8.1                                                                               | 4.6                                                                               | 41.4  |                                                                                   | 2.8                                                                               |      |                                                                                     |                                                                                     |      |
| Green Ext Time (p_c), s       | 0.0                                                                                | 31.5                                                                              |      | 0.1                                                                               | 0.0                                                                               | 41.3  |                                                                                   | 0.0                                                                               |      |                                                                                     |                                                                                     |      |
| Intersection Summary          |                                                                                    |                                                                                   |      |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| HCM 2010 Ctrl Delay           | 9.3                                                                                |                                                                                   |      |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| HCM 2010 LOS                  | A                                                                                  |                                                                                   |      |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |

# HCM 2010 Signalized Intersection Summary

## 9: Honoapiilani Highway & Front Street/Flemming Road

10/05/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                   |  |                                                                                   |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)        | 90                                                                                | 5                                                                                 | 5                                                                                 | 105                                                                               | 15                                                                                | 15                                                                                | 5                                                                                 | 1770                                                                              | 20                                                                                | 10                                                                                  | 1280                                                                                | 195                                                                                 |
| Future Volume (veh/h)         | 90                                                                                | 5                                                                                 | 5                                                                                 | 105                                                                               | 15                                                                                | 15                                                                                | 5                                                                                 | 1770                                                                              | 20                                                                                | 10                                                                                  | 1280                                                                                | 195                                                                                 |
| Number                        | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 98                                                                                | 5                                                                                 | 3                                                                                 | 114                                                                               | 16                                                                                | 12                                                                                | 5                                                                                 | 1924                                                                              | 21                                                                                | 11                                                                                  | 1391                                                                                | 151                                                                                 |
| Adj No. of Lanes              | 0                                                                                 | 1                                                                                 | 0                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 210                                                                               | 8                                                                                 | 5                                                                                 | 198                                                                               | 20                                                                                | 15                                                                                | 7                                                                                 | 2806                                                                              | 31                                                                                | 14                                                                                  | 2782                                                                                | 1245                                                                                |
| Arrive On Green               | 0.11                                                                              | 0.11                                                                              | 0.10                                                                              | 0.11                                                                              | 0.11                                                                              | 0.10                                                                              | 0.00                                                                              | 0.78                                                                              | 0.77                                                                              | 0.01                                                                                | 0.79                                                                                | 0.79                                                                                |
| Sat Flow, veh/h               | 1387                                                                              | 71                                                                                | 42                                                                                | 1312                                                                              | 184                                                                               | 138                                                                               | 1774                                                                              | 3586                                                                              | 39                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h          | 106                                                                               | 0                                                                                 | 0                                                                                 | 142                                                                               | 0                                                                                 | 0                                                                                 | 5                                                                                 | 948                                                                               | 997                                                                               | 11                                                                                  | 1391                                                                                | 151                                                                                 |
| Grp Sat Flow(s),veh/h/ln      | 1500                                                                              | 0                                                                                 | 0                                                                                 | 1634                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                              | 1770                                                                              | 1856                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 1.8                                                                               | 0.0                                                                               | 0.0                                                                               | 0.3                                                                               | 30.1                                                                              | 30.4                                                                              | 0.7                                                                                 | 16.6                                                                                | 2.7                                                                                 |
| Cycle Q Clear(g_c), s         | 7.9                                                                               | 0.0                                                                               | 0.0                                                                               | 9.8                                                                               | 0.0                                                                               | 0.0                                                                               | 0.3                                                                               | 30.1                                                                              | 30.4                                                                              | 0.7                                                                                 | 16.6                                                                                | 2.7                                                                                 |
| Prop In Lane                  | 0.92                                                                              |                                                                                   | 0.03                                                                              | 0.80                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                              |                                                                                   | 0.02                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 223                                                                               | 0                                                                                 | 0                                                                                 | 234                                                                               | 0                                                                                 | 0                                                                                 | 7                                                                                 | 1384                                                                              | 1452                                                                              | 14                                                                                  | 2782                                                                                | 1245                                                                                |
| V/C Ratio(X)                  | 0.48                                                                              | 0.00                                                                              | 0.00                                                                              | 0.61                                                                              | 0.00                                                                              | 0.00                                                                              | 0.73                                                                              | 0.68                                                                              | 0.69                                                                              | 0.81                                                                                | 0.50                                                                                | 0.12                                                                                |
| Avail Cap(c_a), veh/h         | 430                                                                               | 0                                                                                 | 0                                                                                 | 450                                                                               | 0                                                                                 | 0                                                                                 | 118                                                                               | 1384                                                                              | 1452                                                                              | 118                                                                                 | 2782                                                                                | 1245                                                                                |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.62                                                                              | 0.62                                                                              | 0.62                                                                              | 0.84                                                                                | 0.84                                                                                | 0.84                                                                                |
| Uniform Delay (d), s/veh      | 51.1                                                                              | 0.0                                                                               | 0.0                                                                               | 51.8                                                                              | 0.0                                                                               | 0.0                                                                               | 59.7                                                                              | 6.1                                                                               | 6.2                                                                               | 59.5                                                                                | 4.5                                                                                 | 3.0                                                                                 |
| Incr Delay (d2), s/veh        | 1.6                                                                               | 0.0                                                                               | 0.0                                                                               | 2.5                                                                               | 0.0                                                                               | 0.0                                                                               | 29.2                                                                              | 1.7                                                                               | 1.7                                                                               | 28.3                                                                                | 0.5                                                                                 | 0.2                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 8.5                                                                               | 0.0                                                                               | 0.0                                                                               | 4.7                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                               | 15.1                                                                              | 15.9                                                                              | 0.5                                                                                 | 8.1                                                                                 | 1.2                                                                                 |
| LnGrp Delay(d),s/veh          | 52.6                                                                              | 0.0                                                                               | 0.0                                                                               | 54.3                                                                              | 0.0                                                                               | 0.0                                                                               | 88.9                                                                              | 7.8                                                                               | 7.8                                                                               | 87.7                                                                                | 5.1                                                                                 | 3.2                                                                                 |
| LnGrp LOS                     | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | F                                                                                 | A                                                                                 | A                                                                                 | F                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h           |                                                                                   | 106                                                                               |                                                                                   |                                                                                   | 142                                                                               |                                                                                   |                                                                                   | 1950                                                                              |                                                                                   |                                                                                     | 1553                                                                                |                                                                                     |
| Approach Delay, s/veh         |                                                                                   | 52.6                                                                              |                                                                                   |                                                                                   | 54.3                                                                              |                                                                                   |                                                                                   | 8.0                                                                               |                                                                                   |                                                                                     | 5.5                                                                                 |                                                                                     |
| Approach LOS                  |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 4.5                                                                               | 98.3                                                                              |                                                                                   | 17.2                                                                              | 4.9                                                                               | 97.9                                                                              |                                                                                   | 17.2                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 68.0                                                                              | 68.0                                                                              |                                                                                   | 30.0                                                                              | 8.0                                                                               | 68.0                                                                              |                                                                                   | 30.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1/3), s | 12.3                                                                              | 18.6                                                                              |                                                                                   | 11.8                                                                              | 2.7                                                                               | 32.4                                                                              |                                                                                   | 9.9                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.0                                                                               | 32.4                                                                              |                                                                                   | 0.5                                                                               | 0.0                                                                               | 31.8                                                                              |                                                                                   | 0.3                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           | 10.0                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 10: Honoapiilani Highway & Kapunakea Street

10/05/2017

|                              | <div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div> |                                                                                   |                                                                                   |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------|
| Movement                     | EBL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR   | NBL                                                                               | NBT                                                                               | NBR  | SBL                                                                                 | SBT                                                                                 | SBR  |
| Lane Configurations          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |  |  |  |       |  |  |      |  |  |      |
| Traffic Volume (veh/h)       | 150                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 30                                                                                | 20                                                                                | 145                                                                               | 25                                                                                | 35    | 25                                                                                | 1590                                                                              | 75   | 10                                                                                  | 1315                                                                                | 75   |
| Future Volume (veh/h)        | 150                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 30                                                                                | 20                                                                                | 145                                                                               | 25                                                                                | 35    | 25                                                                                | 1590                                                                              | 75   | 10                                                                                  | 1315                                                                                | 75   |
| Number                       | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14    | 1                                                                                 | 6                                                                                 | 16   | 5                                                                                   | 2                                                                                   | 12   |
| Initial Q (Qb), veh          | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0     | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   | 0                                                                                   | 0    |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                   | 0.98                                                                              | 0.99                                                                              |                                                                                   | 0.98  | 1.00                                                                              |                                                                                   | 1.00 | 1.00                                                                                |                                                                                     | 1.00 |
| Parking Bus, Adj             | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00  | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00 |
| Adj Sat Flow, veh/h/ln       | 1900                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900  | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                                | 1863                                                                                | 1900 |
| Adj Flow Rate, veh/h         | 163                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 33                                                                                | 2                                                                                 | 158                                                                               | 27                                                                                | 5     | 27                                                                                | 1728                                                                              | 80   | 11                                                                                  | 1429                                                                                | 79   |
| Adj No. of Lanes             | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0     | 1                                                                                 | 2                                                                                 | 0    | 1                                                                                   | 2                                                                                   | 0    |
| Peak Hour Factor             | 0.92                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92  | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                                | 0.92                                                                                | 0.92 |
| Percent Heavy Veh, %         | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2     | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                   | 2                                                                                   | 2    |
| Cap, veh/h                   | 234                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 38                                                                                | 270                                                                               | 313                                                                               | 264                                                                               | 49    | 34                                                                                | 2528                                                                              | 116  | 13                                                                                  | 2462                                                                                | 136  |
| Arrive On Green              | 0.17                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.17  | 0.04                                                                              | 1.00                                                                              | 1.00 | 0.01                                                                                | 0.72                                                                                | 0.71 |
| Sat Flow, veh/h              | 1077                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 218                                                                               | 1559                                                                              | 1359                                                                              | 1525                                                                              | 282   | 1774                                                                              | 3446                                                                              | 159  | 1774                                                                                | 3411                                                                                | 188  |
| Grp Volume(v), veh/h         | 196                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0                                                                                 | 2                                                                                 | 158                                                                               | 0                                                                                 | 32    | 27                                                                                | 883                                                                               | 925  | 11                                                                                  | 739                                                                                 | 769  |
| Grp Sat Flow(s),veh/h/ln     | 1295                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                                                                                 | 1559                                                                              | 1359                                                                              | 0                                                                                 | 1807  | 1774                                                                              | 1770                                                                              | 1835 | 1774                                                                                | 1770                                                                                | 1830 |
| Q Serve(g_s), s              | 18.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.0                                                                               | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 2.1   | 2.1                                                                               | 0.0                                                                               | 0.0  | 0.9                                                                                 | 27.9                                                                                | 28.3 |
| Cycle Q Clear(g_c), s        | 21.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.0                                                                               | 0.1                                                                               | 13.3                                                                              | 0.0                                                                               | 2.1   | 2.1                                                                               | 0.0                                                                               | 0.0  | 0.9                                                                                 | 27.9                                                                                | 28.3 |
| Prop In Lane                 | 0.83                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.16  | 1.00                                                                              |                                                                                   | 0.09 | 1.00                                                                                |                                                                                     | 0.10 |
| Lane Grp Cap(c), veh/h       | 272                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0                                                                                 | 270                                                                               | 313                                                                               | 0                                                                                 | 313   | 34                                                                                | 1298                                                                              | 1346 | 13                                                                                  | 1277                                                                                | 1321 |
| V/C Ratio(X)                 | 0.72                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.00                                                                              | 0.01                                                                              | 0.50                                                                              | 0.00                                                                              | 0.10  | 0.79                                                                              | 0.68                                                                              | 0.69 | 0.83                                                                                | 0.58                                                                                | 0.58 |
| Avail Cap(c_a), veh/h        | 309                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0                                                                                 | 312                                                                               | 350                                                                               | 0                                                                                 | 361   | 139                                                                               | 1298                                                                              | 1346 | 139                                                                                 | 1277                                                                                | 1321 |
| HCM Platoon Ratio            | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00  | 2.00                                                                              | 2.00                                                                              | 2.00 | 1.00                                                                                | 1.00                                                                                | 1.00 |
| Upstream Filter(I)           | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00  | 0.45                                                                              | 0.45                                                                              | 0.45 | 0.84                                                                                | 0.84                                                                                | 0.84 |
| Uniform Delay (d), s/veh     | 57.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.0                                                                               | 47.9                                                                              | 53.3                                                                              | 0.0                                                                               | 48.8  | 67.0                                                                              | 0.0                                                                               | 0.0  | 69.4                                                                                | 9.3                                                                                 | 9.4  |
| Incr Delay (d2), s/veh       | 6.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.0                                                                               | 0.0                                                                               | 1.3                                                                               | 0.0                                                                               | 0.1   | 6.9                                                                               | 1.3                                                                               | 1.3  | 32.0                                                                                | 1.6                                                                                 | 1.6  |
| Initial Q Delay(d3),s/veh    | 0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0   | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                                 | 0.0                                                                                 | 0.0  |
| %ile BackOfQ(50%),veh/ln     | 7.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.0                                                                               | 0.1                                                                               | 5.7                                                                               | 0.0                                                                               | 1.1   | 1.1                                                                               | 0.5                                                                               | 0.5  | 0.5                                                                                 | 14.1                                                                                | 14.7 |
| LnGrp Delay(d),s/veh         | 64.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.0                                                                               | 47.9                                                                              | 54.6                                                                              | 0.0                                                                               | 48.9  | 74.0                                                                              | 1.3                                                                               | 1.3  | 101.4                                                                               | 10.9                                                                                | 11.0 |
| LnGrp LOS                    | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                   | D                                                                                 | D                                                                                 |                                                                                   | D     | E                                                                                 | A                                                                                 | A    | F                                                                                   | B                                                                                   | B    |
| Approach Vol, veh/h          | 198                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                   | 190                                                                               |                                                                                   |                                                                                   | 1835  |                                                                                   |                                                                                   | 1519 |                                                                                     |                                                                                     |      |
| Approach Delay, s/veh        | 64.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                   | 53.6                                                                              |                                                                                   |                                                                                   | 2.4   |                                                                                   |                                                                                   | 11.6 |                                                                                     |                                                                                     |      |
| Approach LOS                 | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | A     |                                                                                   |                                                                                   | B    |                                                                                     |                                                                                     |      |
| Timer                        | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6     | 7                                                                                 | 8                                                                                 |      |                                                                                     |                                                                                     |      |
| Assigned Phs                 | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6     |                                                                                   | 8                                                                                 |      |                                                                                     |                                                                                     |      |
| Phs Duration (G+Y+Rc), s     | 6.7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 105.1                                                                             |                                                                                   | 28.3                                                                              | 5.0                                                                               | 106.7 |                                                                                   | 28.3                                                                              |      |                                                                                     |                                                                                     |      |
| Change Period (Y+Rc), s      | 4.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0   |                                                                                   | 5.0                                                                               |      |                                                                                     |                                                                                     |      |
| Max Green Setting (Gmax), s  | 11.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 88.0                                                                              |                                                                                   | 27.0                                                                              | 11.0                                                                              | 88.0  |                                                                                   | 27.0                                                                              |      |                                                                                     |                                                                                     |      |
| Max Q Clear Time (g_c+14), s | 14.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 30.3                                                                              |                                                                                   | 15.3                                                                              | 2.9                                                                               | 2.0   |                                                                                   | 23.0                                                                              |      |                                                                                     |                                                                                     |      |
| Green Ext Time (p_c), s      | 0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 26.5                                                                              |                                                                                   | 0.5                                                                               | 0.0                                                                               | 45.3  |                                                                                   | 0.3                                                                               |      |                                                                                     |                                                                                     |      |
| Intersection Summary         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| HCM 2010 Ctrl Delay          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                   | 12.0                                                                              |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| HCM 2010 LOS                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |

# HCM 2010 Signalized Intersection Summary

## 11: Honoapiilani Highway & Keawe Street

10/05/2017

|                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                              |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 15                                                                                | 110                                                                               | 35                                                                                | 95                                                                                | 75                                                                                | 730                                                                               | 25                                                                                | 885                                                                               | 120                                                                               | 535                                                                                 | 890                                                                                 | 20                                                                                  |
| Future Volume (veh/h)        | 15                                                                                | 110                                                                               | 35                                                                                | 95                                                                                | 75                                                                                | 730                                                                               | 25                                                                                | 885                                                                               | 120                                                                               | 535                                                                                 | 890                                                                                 | 20                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.99                                                                              | 0.99                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 16                                                                                | 120                                                                               | 5                                                                                 | 103                                                                               | 82                                                                                | 459                                                                               | 27                                                                                | 962                                                                               | 52                                                                                | 582                                                                                 | 967                                                                                 | 21                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 2                                                                                 | 1                                                                                 | 2                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 54                                                                                | 359                                                                               | 347                                                                               | 369                                                                               | 588                                                                               | 496                                                                               | 34                                                                                | 1465                                                                              | 652                                                                               | 635                                                                                 | 2051                                                                                | 45                                                                                  |
| Arrive On Green              | 0.22                                                                              | 0.22                                                                              | 0.22                                                                              | 0.07                                                                              | 0.32                                                                              | 0.32                                                                              | 0.02                                                                              | 0.41                                                                              | 0.41                                                                              | 0.37                                                                                | 1.00                                                                                | 1.00                                                                                |
| Sat Flow, veh/h              | 113                                                                               | 1617                                                                              | 1564                                                                              | 1774                                                                              | 1863                                                                              | 1570                                                                              | 1774                                                                              | 3539                                                                              | 1576                                                                              | 3442                                                                                | 3542                                                                                | 77                                                                                  |
| Grp Volume(v), veh/h         | 136                                                                               | 0                                                                                 | 5                                                                                 | 103                                                                               | 82                                                                                | 459                                                                               | 27                                                                                | 962                                                                               | 52                                                                                | 582                                                                                 | 483                                                                                 | 505                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1730                                                                              | 0                                                                                 | 1564                                                                              | 1774                                                                              | 1863                                                                              | 1570                                                                              | 1774                                                                              | 1770                                                                              | 1576                                                                              | 1721                                                                                | 1770                                                                                | 1849                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.3                                                                               | 6.0                                                                               | 4.4                                                                               | 39.6                                                                              | 2.1                                                                               | 30.6                                                                              | 2.8                                                                               | 22.6                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Cycle Q Clear(g_c), s        | 8.6                                                                               | 0.0                                                                               | 0.3                                                                               | 6.0                                                                               | 4.4                                                                               | 39.6                                                                              | 2.1                                                                               | 30.6                                                                              | 2.8                                                                               | 22.6                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Prop In Lane                 | 0.12                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 0.04                                                                                |
| Lane Grp Cap(c), veh/h       | 413                                                                               | 0                                                                                 | 347                                                                               | 369                                                                               | 588                                                                               | 496                                                                               | 34                                                                                | 1465                                                                              | 652                                                                               | 635                                                                                 | 1025                                                                                | 1071                                                                                |
| V/C Ratio(X)                 | 0.33                                                                              | 0.00                                                                              | 0.01                                                                              | 0.28                                                                              | 0.14                                                                              | 0.93                                                                              | 0.79                                                                              | 0.66                                                                              | 0.08                                                                              | 0.92                                                                                | 0.47                                                                                | 0.47                                                                                |
| Avail Cap(c_a), veh/h        | 413                                                                               | 0                                                                                 | 347                                                                               | 544                                                                               | 665                                                                               | 561                                                                               | 177                                                                               | 1465                                                                              | 652                                                                               | 836                                                                                 | 1025                                                                                | 1071                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.79                                                                              | 0.79                                                                              | 0.79                                                                              | 0.71                                                                                | 0.71                                                                                | 0.71                                                                                |
| Uniform Delay (d), s/veh     | 45.7                                                                              | 0.0                                                                               | 42.5                                                                              | 36.7                                                                              | 34.3                                                                              | 46.3                                                                              | 68.4                                                                              | 33.0                                                                              | 24.9                                                                              | 43.1                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Incr Delay (d2), s/veh       | 0.5                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.1                                                                               | 20.2                                                                              | 11.4                                                                              | 1.8                                                                               | 0.2                                                                               | 8.0                                                                                 | 1.1                                                                                 | 1.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 4.5                                                                               | 0.0                                                                               | 0.2                                                                               | 3.0                                                                               | 2.3                                                                               | 20.0                                                                              | 1.2                                                                               | 15.3                                                                              | 1.2                                                                               | 11.4                                                                                | 0.3                                                                                 | 0.3                                                                                 |
| LnGrp Delay(d),s/veh         | 46.2                                                                              | 0.0                                                                               | 42.5                                                                              | 37.1                                                                              | 34.4                                                                              | 66.5                                                                              | 79.8                                                                              | 34.9                                                                              | 25.1                                                                              | 51.2                                                                                | 1.1                                                                                 | 1.1                                                                                 |
| LnGrp LOS                    | D                                                                                 |                                                                                   | D                                                                                 | D                                                                                 | C                                                                                 | E                                                                                 | E                                                                                 | C                                                                                 | C                                                                                 | D                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 141                                                                               |                                                                                   |                                                                                   | 644                                                                               |                                                                                   |                                                                                   | 1041                                                                              |                                                                                   |                                                                                     | 1570                                                                                |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 46.0                                                                              |                                                                                   |                                                                                   | 57.7                                                                              |                                                                                   |                                                                                   | 35.5                                                                              |                                                                                   |                                                                                     | 19.7                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 6.7                                                                               | 85.1                                                                              | 13.1                                                                              | 35.1                                                                              | 29.8                                                                              | 61.9                                                                              |                                                                                   | 48.2                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 14.0                                                                              | 63.0                                                                              | 22.0                                                                              | 22.0                                                                              | 34.0                                                                              | 43.0                                                                              |                                                                                   | 49.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+14), s | 14.0                                                                              | 2.0                                                                               | 8.0                                                                               | 10.6                                                                              | 24.6                                                                              | 32.6                                                                              |                                                                                   | 41.6                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 12.7                                                                              | 0.3                                                                               | 0.4                                                                               | 1.3                                                                               | 6.1                                                                               |                                                                                   | 1.6                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 32.8                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

HCM 2010 TWSC  
12: RIRO Access & Honoapiilani Highway

10/05/2017

| Intersection             |        |                                                                                   |                                                                                   |                                                                                   |      |                                                                                     |
|--------------------------|--------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh         | 0.1    |                                                                                   |                                                                                   |                                                                                   |      |                                                                                     |
| Movement                 | WBL    | WBR                                                                               | NBT                                                                               | NBR                                                                               | SBL  | SBT                                                                                 |
| Lane Configurations      |        |  |  |  |      |  |
| Traffic Vol, veh/h       | 0      | 15                                                                                | 700                                                                               | 25                                                                                | 0    | 820                                                                                 |
| Future Vol, veh/h        | 0      | 15                                                                                | 700                                                                               | 25                                                                                | 0    | 820                                                                                 |
| Conflicting Peds, #/hr   | 0      | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   |
| Sign Control             | Stop   | Stop                                                                              | Free                                                                              | Free                                                                              | Free | Free                                                                                |
| RT Channelized           | -      | None                                                                              | -                                                                                 | None                                                                              | -    | None                                                                                |
| Storage Length           | -      | 0                                                                                 | -                                                                                 | 0                                                                                 | -    | -                                                                                   |
| Veh in Median Storage, # | 0      | -                                                                                 | 0                                                                                 | -                                                                                 | -    | 0                                                                                   |
| Grade, %                 | 0      | -                                                                                 | 0                                                                                 | -                                                                                 | -    | 0                                                                                   |
| Peak Hour Factor         | 92     | 92                                                                                | 92                                                                                | 92                                                                                | 92   | 92                                                                                  |
| Heavy Vehicles, %        | 2      | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                   |
| Mvmt Flow                | 0      | 16                                                                                | 761                                                                               | 27                                                                                | 0    | 891                                                                                 |
| Major/Minor              | Minor1 | Major1                                                                            |                                                                                   | Major2                                                                            |      |                                                                                     |
| Conflicting Flow All     | -      | 761                                                                               | 0                                                                                 | 0                                                                                 | -    | -                                                                                   |
| Stage 1                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Stage 2                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Critical Hdwy            | -      | 6.22                                                                              | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Critical Hdwy Stg 1      | -      | -                                                                                 | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Critical Hdwy Stg 2      | -      | -                                                                                 | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Follow-up Hdwy           | -      | 3.318                                                                             | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Pot Cap-1 Maneuver       | 0      | 405                                                                               | -                                                                                 | -                                                                                 | 0    | -                                                                                   |
| Stage 1                  | 0      | -                                                                                 | -                                                                                 | -                                                                                 | 0    | -                                                                                   |
| Stage 2                  | 0      | -                                                                                 | -                                                                                 | -                                                                                 | 0    | -                                                                                   |
| Platoon blocked, %       |        |                                                                                   | -                                                                                 | -                                                                                 |      | -                                                                                   |
| Mov Cap-1 Maneuver       | -      | 405                                                                               | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Mov Cap-2 Maneuver       | -      | -                                                                                 | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Stage 1                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Stage 2                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Approach                 | WB     | NB                                                                                |                                                                                   | SB                                                                                |      |                                                                                     |
| HCM Control Delay, s     | 14.3   | 0                                                                                 |                                                                                   | 0                                                                                 |      |                                                                                     |
| HCM LOS                  | B      |                                                                                   |                                                                                   |                                                                                   |      |                                                                                     |
| Minor Lane/Major Mvmt    | NBT    | NBRWBLn1                                                                          | SBT                                                                               |                                                                                   |      |                                                                                     |
| Capacity (veh/h)         | -      | -                                                                                 | 405                                                                               | -                                                                                 |      |                                                                                     |
| HCM Lane V/C Ratio       | -      | -                                                                                 | 0.04                                                                              | -                                                                                 |      |                                                                                     |
| HCM Control Delay (s)    | -      | -                                                                                 | 14.3                                                                              | -                                                                                 |      |                                                                                     |
| HCM Lane LOS             | -      | -                                                                                 | B                                                                                 | -                                                                                 |      |                                                                                     |
| HCM 95th %tile Q(veh)    | -      | -                                                                                 | 0.1                                                                               | -                                                                                 |      |                                                                                     |

HCM 2010 TWSC  
14: Road A & Akahele Street

10/05/2017

| Intersection             |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|--------|-------------------------------------------------------------------------------------|-------|--------|-------------------------------------------------------------------------------------|-------|
| Int Delay, s/veh         | 4.6                                                                               |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Movement                 | EBL                                                                               | EBT                                                                               | EBR  | WBL                                                                               | WBT                                                                               | WBR  | NBL    | NBT                                                                                 | NBR   | SBL    | SBT                                                                                 | SBR   |
| Lane Configurations      |  |  |      |  |  |      |        |  |       |        |  |       |
| Traffic Vol, veh/h       | 45                                                                                | 40                                                                                | 30   | 5                                                                                 | 95                                                                                | 5    | 35     | 5                                                                                   | 5     | 5      | 5                                                                                   | 60    |
| Future Vol, veh/h        | 45                                                                                | 40                                                                                | 30   | 5                                                                                 | 95                                                                                | 5    | 35     | 5                                                                                   | 5     | 5      | 5                                                                                   | 60    |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0      | 0                                                                                   | 0     | 0      | 0                                                                                   | 0     |
| Sign Control             | Free                                                                              | Free                                                                              | Free | Free                                                                              | Free                                                                              | Free | Stop   | Stop                                                                                | Stop  | Stop   | Stop                                                                                | Stop  |
| RT Channelized           | -                                                                                 | -                                                                                 | None | -                                                                                 | -                                                                                 | None | -      | -                                                                                   | None  | -      | -                                                                                   | None  |
| Storage Length           | 100                                                                               | -                                                                                 | -    | 100                                                                               | -                                                                                 | -    | -      | -                                                                                   | -     | -      | -                                                                                   | -     |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | -    | -                                                                                 | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Grade, %                 | -                                                                                 | 0                                                                                 | -    | -                                                                                 | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Peak Hour Factor         | 92                                                                                | 92                                                                                | 92   | 92                                                                                | 92                                                                                | 92   | 92     | 92                                                                                  | 92    | 92     | 92                                                                                  | 92    |
| Heavy Vehicles, %        | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    | 2      | 2                                                                                   | 2     | 2      | 2                                                                                   | 2     |
| Mvmt Flow                | 49                                                                                | 43                                                                                | 33   | 5                                                                                 | 103                                                                               | 5    | 38     | 5                                                                                   | 5     | 5      | 5                                                                                   | 65    |
|                          |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Major/Minor              | Major1                                                                            |                                                                                   |      | Major2                                                                            |                                                                                   |      | Minor1 |                                                                                     |       | Minor2 |                                                                                     |       |
| Conflicting Flow All     | 108                                                                               | 0                                                                                 | 0    | 76                                                                                | 0                                                                                 | 0    | 309    | 276                                                                                 | 60    | 279    | 290                                                                                 | 106   |
| Stage 1                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 158    | 158                                                                                 | -     | 116    | 116                                                                                 | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 151    | 118                                                                                 | -     | 163    | 174                                                                                 | -     |
| Critical Hdwy            | 4.12                                                                              | -                                                                                 | -    | 4.12                                                                              | -                                                                                 | -    | 7.12   | 6.52                                                                                | 6.22  | 7.12   | 6.52                                                                                | 6.22  |
| Critical Hdwy Stg 1      | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Critical Hdwy Stg 2      | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Follow-up Hdwy           | 2.218                                                                             | -                                                                                 | -    | 2.218                                                                             | -                                                                                 | -    | 3.518  | 4.018                                                                               | 3.318 | 3.518  | 4.018                                                                               | 3.318 |
| Pot Cap-1 Maneuver       | 1483                                                                              | -                                                                                 | -    | 1523                                                                              | -                                                                                 | -    | 643    | 632                                                                                 | 1005  | 673    | 620                                                                                 | 948   |
| Stage 1                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 844    | 767                                                                                 | -     | 889    | 800                                                                                 | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 851    | 798                                                                                 | -     | 839    | 755                                                                                 | -     |
| Platoon blocked, %       |                                                                                   | -                                                                                 | -    |                                                                                   | -                                                                                 | -    |        |                                                                                     |       |        |                                                                                     |       |
| Mov Cap-1 Maneuver       | 1483                                                                              | -                                                                                 | -    | 1523                                                                              | -                                                                                 | -    | 578    | 609                                                                                 | 1005  | 647    | 598                                                                                 | 948   |
| Mov Cap-2 Maneuver       | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 578    | 609                                                                                 | -     | 647    | 598                                                                                 | -     |
| Stage 1                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 816    | 742                                                                                 | -     | 860    | 798                                                                                 | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 784    | 796                                                                                 | -     | 801    | 730                                                                                 | -     |
|                          |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Approach                 | EB                                                                                |                                                                                   |      | WB                                                                                |                                                                                   |      | NB     |                                                                                     |       | SB     |                                                                                     |       |
| HCM Control Delay, s     | 2.9                                                                               |                                                                                   |      | 0.4                                                                               |                                                                                   |      | 11.4   |                                                                                     |       | 9.5    |                                                                                     |       |
| HCM LOS                  |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      | B      |                                                                                     |       | A      |                                                                                     |       |
|                          |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Minor Lane/Major Mvmt    | NBLn1                                                                             | EBL                                                                               | EBT  | EBR                                                                               | WBL                                                                               | WBT  | WBR    | SBLn1                                                                               |       |        |                                                                                     |       |
| Capacity (veh/h)         | 610                                                                               | 1483                                                                              | -    | -                                                                                 | 1523                                                                              | -    | -      | 882                                                                                 |       |        |                                                                                     |       |
| HCM Lane V/C Ratio       | 0.08                                                                              | 0.033                                                                             | -    | -                                                                                 | 0.004                                                                             | -    | -      | 0.086                                                                               |       |        |                                                                                     |       |
| HCM Control Delay (s)    | 11.4                                                                              | 7.5                                                                               | -    | -                                                                                 | 7.4                                                                               | -    | -      | 9.5                                                                                 |       |        |                                                                                     |       |
| HCM Lane LOS             | B                                                                                 | A                                                                                 | -    | -                                                                                 | A                                                                                 | -    | -      | A                                                                                   |       |        |                                                                                     |       |
| HCM 95th %tile O(veh)    | 0.3                                                                               | 0.1                                                                               | -    | -                                                                                 | 0                                                                                 | -    | -      | 0.3                                                                                 |       |        |                                                                                     |       |

| Intersection             |        |       |      |        |       |      |        |       |       |        |       |       |
|--------------------------|--------|-------|------|--------|-------|------|--------|-------|-------|--------|-------|-------|
| Int Delay, s/veh         | 4.4    |       |      |        |       |      |        |       |       |        |       |       |
| Movement                 | EBL    | EBT   | EBR  | WBL    | WBT   | WBR  | NBL    | NBT   | NBR   | SBL    | SBT   | SBR   |
| Lane Configurations      |        | ↕     |      |        | ↕     |      |        | ↕     |       |        | ↕     |       |
| Traffic Vol, veh/h       | 10     | 20    | 20   | 5      | 10    | 5    | 0      | 5     | 5     | 5      | 5     | 25    |
| Future Vol, veh/h        | 10     | 20    | 20   | 5      | 10    | 5    | 0      | 5     | 5     | 5      | 5     | 25    |
| Conflicting Peds, #/hr   | 0      | 0     | 0    | 0      | 0     | 0    | 0      | 0     | 0     | 0      | 0     | 0     |
| Sign Control             | Free   | Free  | Free | Free   | Free  | Free | Stop   | Stop  | Stop  | Stop   | Stop  | Stop  |
| RT Channelized           | -      | -     | None | -      | -     | None | -      | -     | None  | -      | -     | None  |
| Storage Length           | -      | -     | -    | -      | -     | -    | -      | -     | -     | -      | -     | -     |
| Veh in Median Storage, # | -      | 0     | -    | -      | 0     | -    | -      | 0     | -     | -      | 0     | -     |
| Grade, %                 | -      | 0     | -    | -      | 0     | -    | -      | 0     | -     | -      | 0     | -     |
| Peak Hour Factor         | 92     | 92    | 92   | 92     | 92    | 92   | 92     | 92    | 92    | 92     | 92    | 92    |
| Heavy Vehicles, %        | 2      | 2     | 2    | 2      | 2     | 2    | 2      | 2     | 2     | 2      | 2     | 2     |
| Mvmt Flow                | 11     | 22    | 22   | 5      | 11    | 5    | 0      | 5     | 5     | 5      | 5     | 27    |
|                          |        |       |      |        |       |      |        |       |       |        |       |       |
| Major/Minor              | Major1 |       |      | Major2 |       |      | Minor1 |       |       | Minor2 |       |       |
| Conflicting Flow All     | 16     | 0     | 0    | 44     | 0     | 0    | 95     | 81    | 33    | 84     | 90    | 14    |
| Stage 1                  | -      | -     | -    | -      | -     | -    | 55     | 55    | -     | 24     | 24    | -     |
| Stage 2                  | -      | -     | -    | -      | -     | -    | 40     | 26    | -     | 60     | 66    | -     |
| Critical Hdwy            | 4.12   | -     | -    | 4.12   | -     | -    | 7.12   | 6.52  | 6.22  | 7.12   | 6.52  | 6.22  |
| Critical Hdwy Stg 1      | -      | -     | -    | -      | -     | -    | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Critical Hdwy Stg 2      | -      | -     | -    | -      | -     | -    | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Follow-up Hdwy           | 2.218  | -     | -    | 2.218  | -     | -    | 3.518  | 4.018 | 3.318 | 3.518  | 4.018 | 3.318 |
| Pot Cap-1 Maneuver       | 1602   | -     | -    | 1564   | -     | -    | 888    | 809   | 1041  | 903    | 800   | 1066  |
| Stage 1                  | -      | -     | -    | -      | -     | -    | 957    | 849   | -     | 994    | 875   | -     |
| Stage 2                  | -      | -     | -    | -      | -     | -    | 975    | 874   | -     | 951    | 840   | -     |
| Platoon blocked, %       |        | -     | -    |        | -     | -    |        |       |       |        |       |       |
| Mov Cap-1 Maneuver       | 1602   | -     | -    | 1564   | -     | -    | 854    | 801   | 1041  | 887    | 792   | 1066  |
| Mov Cap-2 Maneuver       | -      | -     | -    | -      | -     | -    | 854    | 801   | -     | 887    | 792   | -     |
| Stage 1                  | -      | -     | -    | -      | -     | -    | 950    | 843   | -     | 987    | 872   | -     |
| Stage 2                  | -      | -     | -    | -      | -     | -    | 941    | 871   | -     | 933    | 834   | -     |
|                          |        |       |      |        |       |      |        |       |       |        |       |       |
| Approach                 | EB     |       |      | WB     |       |      | NB     |       |       | SB     |       |       |
| HCM Control Delay, s     | 1.5    |       |      | 1.8    |       |      | 9      |       |       | 8.8    |       |       |
| HCM LOS                  |        |       |      |        |       |      | A      |       |       | A      |       |       |
|                          |        |       |      |        |       |      |        |       |       |        |       |       |
| Minor Lane/Major Mvmt    | NBLn1  | EBL   | EBT  | EBR    | WBL   | WBT  | WBR    | SBLn1 |       |        |       |       |
| Capacity (veh/h)         | 905    | 1602  | -    | -      | 1564  | -    | -      | 989   |       |        |       |       |
| HCM Lane V/C Ratio       | 0.012  | 0.007 | -    | -      | 0.003 | -    | -      | 0.038 |       |        |       |       |
| HCM Control Delay (s)    | 9      | 7.3   | 0    | -      | 7.3   | 0    | -      | 8.8   |       |        |       |       |
| HCM Lane LOS             | A      | A     | A    | -      | A     | A    | -      | A     |       |        |       |       |
| HCM 95th %tile Q(veh)    | 0      | 0     | -    | -      | 0     | -    | -      | 0.1   |       |        |       |       |





---

## **APPENDIX C**

### LEVEL OF SERVICE CALCULATIONS

- Future Year 2022 Scenario 2 PM Peak
-

# HCM 2010 Signalized Intersection Summary

## 1: Napilihau Street

10/05/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 55                                                                                | 25                                                                                | 400                                                                               | 60                                                                                | 25                                                                                | 5                                                                                 | 410                                                                                 | 230                                                                                 | 65                                                                                  | 10                                                                                  | 300                                                                                 | 75                                                                                  |
| Future Volume (veh/h)        | 55                                                                                | 25                                                                                | 400                                                                               | 60                                                                                | 25                                                                                | 5                                                                                 | 410                                                                                 | 230                                                                                 | 65                                                                                  | 10                                                                                  | 300                                                                                 | 75                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 60                                                                                | 27                                                                                | 28                                                                                | 65                                                                                | 27                                                                                | 1                                                                                 | 446                                                                                 | 250                                                                                 | 45                                                                                  | 11                                                                                  | 326                                                                                 | 21                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 219                                                                               | 66                                                                                | 175                                                                               | 216                                                                               | 198                                                                               | 7                                                                                 | 530                                                                                 | 1061                                                                                | 902                                                                                 | 15                                                                                  | 521                                                                                 | 443                                                                                 |
| Arrive On Green              | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.30                                                                                | 0.57                                                                                | 0.57                                                                                | 0.01                                                                                | 0.28                                                                                | 0.28                                                                                |
| Sat Flow, veh/h              | 906                                                                               | 599                                                                               | 1583                                                                              | 1343                                                                              | 1785                                                                              | 66                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 87                                                                                | 0                                                                                 | 28                                                                                | 65                                                                                | 0                                                                                 | 28                                                                                | 446                                                                                 | 250                                                                                 | 45                                                                                  | 11                                                                                  | 326                                                                                 | 21                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1504                                                                              | 0                                                                                 | 1583                                                                              | 1343                                                                              | 0                                                                                 | 1851                                                                              | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 2.1                                                                               | 0.0                                                                               | 0.8                                                                               | 2.5                                                                               | 0.0                                                                               | 0.7                                                                               | 12.1                                                                                | 3.4                                                                                 | 0.6                                                                                 | 0.3                                                                                 | 7.9                                                                                 | 0.5                                                                                 |
| Cycle Q Clear(g_c), s        | 2.8                                                                               | 0.0                                                                               | 0.8                                                                               | 5.3                                                                               | 0.0                                                                               | 0.7                                                                               | 12.1                                                                                | 3.4                                                                                 | 0.6                                                                                 | 0.3                                                                                 | 7.9                                                                                 | 0.5                                                                                 |
| Prop In Lane                 | 0.69                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.04                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 285                                                                               | 0                                                                                 | 175                                                                               | 216                                                                               | 0                                                                                 | 205                                                                               | 530                                                                                 | 1061                                                                                | 902                                                                                 | 15                                                                                  | 521                                                                                 | 443                                                                                 |
| V/C Ratio(X)                 | 0.31                                                                              | 0.00                                                                              | 0.16                                                                              | 0.30                                                                              | 0.00                                                                              | 0.14                                                                              | 0.84                                                                                | 0.24                                                                                | 0.05                                                                                | 0.73                                                                                | 0.63                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h        | 818                                                                               | 0                                                                                 | 739                                                                               | 694                                                                               | 0                                                                                 | 864                                                                               | 1035                                                                                | 2861                                                                                | 2432                                                                                | 517                                                                                 | 2318                                                                                | 1970                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 21.6                                                                              | 0.0                                                                               | 20.7                                                                              | 24.1                                                                              | 0.0                                                                               | 20.6                                                                              | 16.9                                                                                | 5.5                                                                                 | 4.9                                                                                 | 25.4                                                                                | 16.2                                                                                | 13.5                                                                                |
| Incr Delay (d2), s/veh       | 0.6                                                                               | 0.0                                                                               | 0.4                                                                               | 0.8                                                                               | 0.0                                                                               | 0.3                                                                               | 3.7                                                                                 | 0.2                                                                                 | 0.0                                                                                 | 49.8                                                                                | 2.6                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.2                                                                               | 0.0                                                                               | 0.4                                                                               | 0.9                                                                               | 0.0                                                                               | 0.4                                                                               | 6.4                                                                                 | 1.8                                                                                 | 0.3                                                                                 | 0.4                                                                                 | 4.4                                                                                 | 0.2                                                                                 |
| LnGrp Delay(d),s/veh         | 22.2                                                                              | 0.0                                                                               | 21.1                                                                              | 24.8                                                                              | 0.0                                                                               | 20.9                                                                              | 20.6                                                                                | 5.7                                                                                 | 4.9                                                                                 | 75.2                                                                                | 18.8                                                                                | 13.6                                                                                |
| LnGrp LOS                    | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 115                                                                               |                                                                                   |                                                                                   | 93                                                                                |                                                                                   |                                                                                     | 741                                                                                 |                                                                                     |                                                                                     | 358                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 21.9                                                                              |                                                                                   |                                                                                   | 23.7                                                                              |                                                                                   |                                                                                     | 14.6                                                                                |                                                                                     |                                                                                     | 20.2                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.4                                                                               | 35.3                                                                              |                                                                                   | 10.7                                                                              | 20.4                                                                              | 20.4                                                                              |                                                                                     | 10.7                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 79.0                                                                              |                                                                                   | 24.0                                                                              | 30.0                                                                              | 64.0                                                                              |                                                                                     | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.3                                                                               | 5.4                                                                               |                                                                                   | 4.8                                                                               | 14.1                                                                              | 9.9                                                                               |                                                                                     | 7.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 3.6                                                                               |                                                                                   | 0.5                                                                               | 1.3                                                                               | 4.5                                                                               |                                                                                     | 0.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 17.5                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 2: Hoohui Road

10/05/2017

|                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|--------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                       | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations            |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)         | 75                                                                                | 20                                                                                | 165                                                                               | 50                                                                                | 15                                                                                | 10                                                                                | 215                                                                               | 635                                                                               | 45                                                                                | 25                                                                                  | 630                                                                                 | 80                                                                                  |
| Future Volume (veh/h)          | 75                                                                                | 20                                                                                | 165                                                                               | 50                                                                                | 15                                                                                | 10                                                                                | 215                                                                               | 635                                                                               | 45                                                                                | 25                                                                                  | 630                                                                                 | 80                                                                                  |
| Number                         | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                 | 2                                                                                 | 12                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)            | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln         | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h           | 82                                                                                | 22                                                                                | 14                                                                                | 54                                                                                | 16                                                                                | 1                                                                                 | 234                                                                               | 690                                                                               | 0                                                                                 | 27                                                                                  | 685                                                                                 | 47                                                                                  |
| Adj No. of Lanes               | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor               | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %           | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                     | 265                                                                               | 57                                                                                | 211                                                                               | 233                                                                               | 231                                                                               | 14                                                                                | 425                                                                               | 1013                                                                              | 861                                                                               | 376                                                                                 | 852                                                                                 | 721                                                                                 |
| Arrive On Green                | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.11                                                                              | 0.54                                                                              | 0.00                                                                              | 0.02                                                                                | 0.46                                                                                | 0.46                                                                                |
| Sat Flow, veh/h                | 1070                                                                              | 429                                                                               | 1583                                                                              | 1367                                                                              | 1735                                                                              | 108                                                                               | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1576                                                                                |
| Grp Volume(v), veh/h           | 104                                                                               | 0                                                                                 | 14                                                                                | 54                                                                                | 0                                                                                 | 17                                                                                | 234                                                                               | 690                                                                               | 0                                                                                 | 27                                                                                  | 685                                                                                 | 47                                                                                  |
| Grp Sat Flow(s),veh/h/ln       | 1499                                                                              | 0                                                                                 | 1583                                                                              | 1367                                                                              | 0                                                                                 | 1844                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1576                                                                                |
| Q Serve(g_s), s                | 2.8                                                                               | 0.0                                                                               | 0.4                                                                               | 2.0                                                                               | 0.0                                                                               | 0.4                                                                               | 3.3                                                                               | 14.1                                                                              | 0.0                                                                               | 0.4                                                                                 | 16.6                                                                                | 0.9                                                                                 |
| Cycle Q Clear(g_c), s          | 3.3                                                                               | 0.0                                                                               | 0.4                                                                               | 5.3                                                                               | 0.0                                                                               | 0.4                                                                               | 3.3                                                                               | 14.1                                                                              | 0.0                                                                               | 0.4                                                                                 | 16.6                                                                                | 0.9                                                                                 |
| Prop In Lane                   | 0.79                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h         | 322                                                                               | 0                                                                                 | 211                                                                               | 233                                                                               | 0                                                                                 | 246                                                                               | 425                                                                               | 1013                                                                              | 861                                                                               | 376                                                                                 | 852                                                                                 | 721                                                                                 |
| V/C Ratio(X)                   | 0.32                                                                              | 0.00                                                                              | 0.07                                                                              | 0.23                                                                              | 0.00                                                                              | 0.07                                                                              | 0.55                                                                              | 0.68                                                                              | 0.00                                                                              | 0.07                                                                                | 0.80                                                                                | 0.07                                                                                |
| Avail Cap(c_a), veh/h          | 824                                                                               | 0                                                                                 | 752                                                                               | 700                                                                               | 0                                                                                 | 876                                                                               | 745                                                                               | 1805                                                                              | 1534                                                                              | 849                                                                                 | 1805                                                                                | 1528                                                                                |
| HCM Platoon Ratio              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)             | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh       | 21.1                                                                              | 0.0                                                                               | 19.9                                                                              | 23.7                                                                              | 0.0                                                                               | 19.9                                                                              | 9.7                                                                               | 8.7                                                                               | 0.0                                                                               | 8.2                                                                                 | 12.2                                                                                | 8.0                                                                                 |
| Incr Delay (d2), s/veh         | 0.6                                                                               | 0.0                                                                               | 0.1                                                                               | 0.5                                                                               | 0.0                                                                               | 0.1                                                                               | 1.1                                                                               | 0.8                                                                               | 0.0                                                                               | 0.1                                                                                 | 1.8                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh      | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln       | 1.4                                                                               | 0.0                                                                               | 0.2                                                                               | 0.8                                                                               | 0.0                                                                               | 0.2                                                                               | 1.8                                                                               | 7.3                                                                               | 0.0                                                                               | 0.2                                                                                 | 8.8                                                                                 | 0.4                                                                                 |
| LnGrp Delay(d),s/veh           | 21.7                                                                              | 0.0                                                                               | 20.1                                                                              | 24.2                                                                              | 0.0                                                                               | 20.1                                                                              | 10.8                                                                              | 9.5                                                                               | 0.0                                                                               | 8.3                                                                                 | 14.1                                                                                | 8.0                                                                                 |
| LnGrp LOS                      | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                 |                                                                                   | C                                                                                 | B                                                                                 | A                                                                                 |                                                                                   | A                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h            |                                                                                   | 118                                                                               |                                                                                   |                                                                                   | 71                                                                                |                                                                                   |                                                                                   | 924                                                                               |                                                                                   |                                                                                     | 759                                                                                 |                                                                                     |
| Approach Delay, s/veh          |                                                                                   | 21.5                                                                              |                                                                                   |                                                                                   | 23.2                                                                              |                                                                                   |                                                                                   | 9.8                                                                               |                                                                                   |                                                                                     | 13.5                                                                                |                                                                                     |
| Approach LOS                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |
| Timer                          | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                   | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s       | 6.0                                                                               | 34.6                                                                              |                                                                                   | 12.0                                                                              | 10.5                                                                              | 30.1                                                                              |                                                                                   | 12.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s        | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s    | 15.0                                                                              | 51.0                                                                              |                                                                                   | 25.0                                                                              | 15.0                                                                              | 51.0                                                                              |                                                                                   | 25.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+12.4), s | 12.4                                                                              | 16.1                                                                              |                                                                                   | 5.3                                                                               | 5.3                                                                               | 18.6                                                                              |                                                                                   | 7.3                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s        | 0.0                                                                               | 5.3                                                                               |                                                                                   | 0.5                                                                               | 0.5                                                                               | 5.4                                                                               |                                                                                   | 0.2                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay            |                                                                                   |                                                                                   | 12.6                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 3: Honoapiilani Highway & Akahele Street

10/05/2017

|                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
|-----------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                             |  |  |  |  |  |  |  |  |   |  |  |  |
| Movement                    | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                                | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations         |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)      | 60                                                                                | 45                                                                                | 95                                                                                | 120                                                                               | 45                                                                                | 55                                                                                | 165                                                                               | 845                                                                               | 115                                                                                | 100                                                                                 | 745                                                                                 | 75                                                                                  |
| Future Volume (veh/h)       | 60                                                                                | 45                                                                                | 95                                                                                | 120                                                                               | 45                                                                                | 55                                                                                | 165                                                                               | 845                                                                               | 115                                                                                | 100                                                                                 | 745                                                                                 | 75                                                                                  |
| Number                      | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                 | 2                                                                                 | 12                                                                                 | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh         | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)         | 1.00                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln      | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h        | 65                                                                                | 49                                                                                | 48                                                                                | 130                                                                               | 49                                                                                | 6                                                                                 | 179                                                                               | 918                                                                               | 79                                                                                 | 109                                                                                 | 810                                                                                 | 36                                                                                  |
| Adj No. of Lanes            | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor            | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %        | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                  | 85                                                                                | 94                                                                                | 92                                                                                | 161                                                                               | 286                                                                               | 239                                                                               | 214                                                                               | 992                                                                               | 843                                                                                | 138                                                                                 | 913                                                                                 | 774                                                                                 |
| Arrive On Green             | 0.05                                                                              | 0.11                                                                              | 0.11                                                                              | 0.09                                                                              | 0.15                                                                              | 0.15                                                                              | 0.12                                                                              | 0.53                                                                              | 0.53                                                                               | 0.08                                                                                | 0.49                                                                                | 0.49                                                                                |
| Sat Flow, veh/h             | 1774                                                                              | 850                                                                               | 833                                                                               | 1774                                                                              | 1863                                                                              | 1562                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                               | 1774                                                                                | 1863                                                                                | 1580                                                                                |
| Grp Volume(v), veh/h        | 65                                                                                | 0                                                                                 | 97                                                                                | 130                                                                               | 49                                                                                | 6                                                                                 | 179                                                                               | 918                                                                               | 79                                                                                 | 109                                                                                 | 810                                                                                 | 36                                                                                  |
| Grp Sat Flow(s),veh/h/ln    | 1774                                                                              | 0                                                                                 | 1684                                                                              | 1774                                                                              | 1863                                                                              | 1562                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                               | 1774                                                                                | 1863                                                                                | 1580                                                                                |
| Q Serve(g_s), s             | 3.8                                                                               | 0.0                                                                               | 5.8                                                                               | 7.6                                                                               | 2.4                                                                               | 0.3                                                                               | 10.5                                                                              | 48.2                                                                              | 2.6                                                                                | 6.4                                                                                 | 41.6                                                                                | 1.3                                                                                 |
| Cycle Q Clear(g_c), s       | 3.8                                                                               | 0.0                                                                               | 5.8                                                                               | 7.6                                                                               | 2.4                                                                               | 0.3                                                                               | 10.5                                                                              | 48.2                                                                              | 2.6                                                                                | 6.4                                                                                 | 41.6                                                                                | 1.3                                                                                 |
| Prop In Lane                | 1.00                                                                              |                                                                                   | 0.49                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h      | 85                                                                                | 0                                                                                 | 186                                                                               | 161                                                                               | 286                                                                               | 239                                                                               | 214                                                                               | 992                                                                               | 843                                                                                | 138                                                                                 | 913                                                                                 | 774                                                                                 |
| V/C Ratio(X)                | 0.77                                                                              | 0.00                                                                              | 0.52                                                                              | 0.81                                                                              | 0.17                                                                              | 0.03                                                                              | 0.84                                                                              | 0.93                                                                              | 0.09                                                                               | 0.79                                                                                | 0.89                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h       | 335                                                                               | 0                                                                                 | 333                                                                               | 335                                                                               | 369                                                                               | 309                                                                               | 418                                                                               | 1142                                                                              | 971                                                                                | 418                                                                                 | 1142                                                                                | 969                                                                                 |
| HCM Platoon Ratio           | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)          | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh    | 49.9                                                                              | 0.0                                                                               | 44.5                                                                              | 47.3                                                                              | 39.0                                                                              | 38.1                                                                              | 45.6                                                                              | 22.9                                                                              | 12.2                                                                               | 48.0                                                                                | 24.4                                                                                | 14.1                                                                                |
| Incr Delay (d2), s/veh      | 13.4                                                                              | 0.0                                                                               | 2.3                                                                               | 9.1                                                                               | 0.3                                                                               | 0.0                                                                               | 8.4                                                                               | 11.6                                                                              | 0.0                                                                                | 9.5                                                                                 | 7.4                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh   | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln    | 2.2                                                                               | 0.0                                                                               | 2.8                                                                               | 4.1                                                                               | 1.3                                                                               | 0.2                                                                               | 5.6                                                                               | 27.7                                                                              | 1.1                                                                                | 3.5                                                                                 | 23.0                                                                                | 0.6                                                                                 |
| LnGrp Delay(d),s/veh        | 63.3                                                                              | 0.0                                                                               | 46.8                                                                              | 56.4                                                                              | 39.3                                                                              | 38.2                                                                              | 54.1                                                                              | 34.5                                                                              | 12.3                                                                               | 57.5                                                                                | 31.8                                                                                | 14.1                                                                                |
| LnGrp LOS                   | E                                                                                 |                                                                                   | D                                                                                 | E                                                                                 | D                                                                                 | D                                                                                 | D                                                                                 | C                                                                                 | B                                                                                  | E                                                                                   | C                                                                                   | B                                                                                   |
| Approach Vol, veh/h         | 162                                                                               |                                                                                   |                                                                                   | 185                                                                               |                                                                                   |                                                                                   | 1176                                                                              |                                                                                   |                                                                                    | 955                                                                                 |                                                                                     |                                                                                     |
| Approach Delay, s/veh       | 53.4                                                                              |                                                                                   |                                                                                   | 51.3                                                                              |                                                                                   |                                                                                   | 36.0                                                                              |                                                                                   |                                                                                    | 34.1                                                                                |                                                                                     |                                                                                     |
| Approach LOS                | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                    | C                                                                                   |                                                                                     |                                                                                     |
| Timer                       | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s    | 13.3                                                                              | 61.4                                                                              | 14.6                                                                              | 16.7                                                                              | 17.8                                                                              | 56.9                                                                              | 10.1                                                                              | 21.3                                                                              |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s     | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1), s | 19.4                                                                              | 50.2                                                                              | 9.6                                                                               | 7.8                                                                               | 12.5                                                                              | 43.6                                                                              | 5.8                                                                               | 4.4                                                                               |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s     | 0.2                                                                               | 6.3                                                                               | 0.2                                                                               | 0.3                                                                               | 0.4                                                                               | 6.1                                                                               | 0.1                                                                               | 0.2                                                                               |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay         | 37.5                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                | D                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Notes                       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 4: Honoapiilani Highway & Lower Honoapiilani Road

10/05/2017

|                               |  |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                      | EBL                                                                                | EBT                                                                               | EBR                                                                               | WBL  | WBT                                                                               | WBR  | NBL                                                                               | NBT                                                                               | NBR  | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                    |  |  |      |  |      |  |  |      |  |  |  |
| Traffic Volume (veh/h)        | 85                                                                                 | 5                                                                                 | 600                                                                               | 80   | 10                                                                                | 10   | 605                                                                               | 1005                                                                              | 10   | 5                                                                                   | 900                                                                                 | 20                                                                                  |
| Future Volume (veh/h)         | 85                                                                                 | 5                                                                                 | 600                                                                               | 80   | 10                                                                                | 10   | 605                                                                               | 1005                                                                              | 10   | 5                                                                                   | 900                                                                                 | 20                                                                                  |
| Number                        | 3                                                                                  | 8                                                                                 | 18                                                                                | 7    | 4                                                                                 | 14   | 1                                                                                 | 6                                                                                 | 16   | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                  | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                               |                                                                                   | 1.00                                                                              | 1.00 |                                                                                   | 1.00 | 1.00                                                                              |                                                                                   | 1.00 | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                               | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 92                                                                                 | 5                                                                                 | 0                                                                                 | 87   | 11                                                                                | 9    | 658                                                                               | 1092                                                                              | 11   | 5                                                                                   | 978                                                                                 | 6                                                                                   |
| Adj No. of Lanes              | 0                                                                                  | 1                                                                                 | 1                                                                                 | 0    | 1                                                                                 | 0    | 1                                                                                 | 2                                                                                 | 0    | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                               | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                  | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 193                                                                                | 7                                                                                 | 135                                                                               | 179  | 14                                                                                | 12   | 699                                                                               | 2739                                                                              | 28   | 7                                                                                   | 1321                                                                                | 591                                                                                 |
| Arrive On Green               | 0.09                                                                               | 0.09                                                                              | 0.00                                                                              | 0.09 | 0.09                                                                              | 0.09 | 0.39                                                                              | 0.76                                                                              | 0.76 | 0.00                                                                                | 0.37                                                                                | 0.37                                                                                |
| Sat Flow, veh/h               | 1460                                                                               | 79                                                                                | 1583                                                                              | 1345 | 170                                                                               | 139  | 1774                                                                              | 3590                                                                              | 36   | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h          | 97                                                                                 | 0                                                                                 | 0                                                                                 | 107  | 0                                                                                 | 0    | 658                                                                               | 538                                                                               | 565  | 5                                                                                   | 978                                                                                 | 6                                                                                   |
| Grp Sat Flow(s),veh/h/ln      | 1540                                                                               | 0                                                                                 | 1583                                                                              | 1655 | 0                                                                                 | 0    | 1774                                                                              | 1770                                                                              | 1856 | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s               | 0.0                                                                                | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0  | 36.2                                                                              | 10.5                                                                              | 10.5 | 0.3                                                                                 | 24.3                                                                                | 0.2                                                                                 |
| Cycle Q Clear(g_c), s         | 5.8                                                                                | 0.0                                                                               | 0.0                                                                               | 5.9  | 0.0                                                                               | 0.0  | 36.2                                                                              | 10.5                                                                              | 10.5 | 0.3                                                                                 | 24.3                                                                                | 0.2                                                                                 |
| Prop In Lane                  | 0.95                                                                               |                                                                                   | 1.00                                                                              | 0.81 |                                                                                   | 0.08 | 1.00                                                                              |                                                                                   | 0.02 | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 215                                                                                | 0                                                                                 | 135                                                                               | 221  | 0                                                                                 | 0    | 699                                                                               | 1350                                                                              | 1417 | 7                                                                                   | 1321                                                                                | 591                                                                                 |
| V/C Ratio(X)                  | 0.45                                                                               | 0.00                                                                              | 0.00                                                                              | 0.48 | 0.00                                                                              | 0.00 | 0.94                                                                              | 0.40                                                                              | 0.40 | 0.73                                                                                | 0.74                                                                                | 0.01                                                                                |
| Avail Cap(c_a), veh/h         | 511                                                                                | 0                                                                                 | 469                                                                               | 485  | 0                                                                                 | 0    | 1243                                                                              | 1350                                                                              | 1417 | 1243                                                                                | 1991                                                                                | 891                                                                                 |
| HCM Platoon Ratio             | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                               | 0.00                                                                              | 0.00                                                                              | 1.00 | 0.00                                                                              | 0.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 44.6                                                                               | 0.0                                                                               | 0.0                                                                               | 44.7 | 0.0                                                                               | 0.0  | 29.6                                                                              | 4.1                                                                               | 4.1  | 50.4                                                                                | 27.5                                                                                | 20.0                                                                                |
| Incr Delay (d2), s/veh        | 1.5                                                                                | 0.0                                                                               | 0.0                                                                               | 1.6  | 0.0                                                                               | 0.0  | 4.7                                                                               | 0.4                                                                               | 0.4  | 41.4                                                                                | 1.8                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                                | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 2.7                                                                                | 0.0                                                                               | 0.0                                                                               | 3.0  | 0.0                                                                               | 0.0  | 18.6                                                                              | 5.2                                                                               | 5.5  | 0.2                                                                                 | 12.1                                                                                | 0.1                                                                                 |
| LnGrp Delay(d),s/veh          | 46.1                                                                               | 0.0                                                                               | 0.0                                                                               | 46.3 | 0.0                                                                               | 0.0  | 34.3                                                                              | 4.5                                                                               | 4.5  | 91.8                                                                                | 29.3                                                                                | 20.0                                                                                |
| LnGrp LOS                     | D                                                                                  |                                                                                   |                                                                                   | D    |                                                                                   |      | C                                                                                 | A                                                                                 | A    | F                                                                                   | C                                                                                   | C                                                                                   |
| Approach Vol, veh/h           | 97                                                                                 |                                                                                   |                                                                                   | 107  |                                                                                   |      | 1761                                                                              |                                                                                   |      | 989                                                                                 |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 46.1                                                                               |                                                                                   |                                                                                   | 46.3 |                                                                                   |      | 15.6                                                                              |                                                                                   |      | 29.5                                                                                |                                                                                     |                                                                                     |
| Approach LOS                  | D                                                                                  |                                                                                   |                                                                                   | D    |                                                                                   |      | B                                                                                 |                                                                                   |      | C                                                                                   |                                                                                     |                                                                                     |
| Timer                         | 1                                                                                  | 2                                                                                 | 3                                                                                 | 4    | 5                                                                                 | 6    | 7                                                                                 | 8                                                                                 |      |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                  | 2                                                                                 |                                                                                   | 4    | 5                                                                                 | 6    |                                                                                   | 8                                                                                 |      |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 43.9                                                                               | 43.8                                                                              |                                                                                   | 13.6 | 4.4                                                                               | 83.3 |                                                                                   | 13.6                                                                              |      |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                                | 6.0                                                                               |                                                                                   | 5.0  | 4.0                                                                               | 6.0  |                                                                                   | 5.0                                                                               |      |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 71.0                                                                               | 57.0                                                                              |                                                                                   | 27.0 | 71.0                                                                              | 57.0 |                                                                                   | 30.0                                                                              |      |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+Q_c), s | 49.2                                                                               | 26.3                                                                              |                                                                                   | 7.9  | 2.3                                                                               | 12.5 |                                                                                   | 7.8                                                                               |      |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 1.7                                                                                | 11.6                                                                              |                                                                                   | 0.3  | 0.0                                                                               | 14.2 |                                                                                   | 0.3                                                                               |      |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                    |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           | 22.4                                                                               |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  | C                                                                                  |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Notes                         |                                                                                    |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 5: Honoapiilani Highway & Halawai Drive

10/05/2017

|                               | <div></div> |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                      | EBL                                                                                           | EBT                                                                               | EBR                                                                               | WBL  | WBT                                                                               | WBR  | NBL                                                                               | NBT                                                                               | NBR  | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                               |  |  |      |  |      |  |  |      |  |  |  |
| Traffic Volume (veh/h)        | 55                                                                                            | 5                                                                                 | 140                                                                               | 15   | 0                                                                                 | 5    | 135                                                                               | 1555                                                                              | 10   | 10                                                                                  | 1570                                                                                | 60                                                                                  |
| Future Volume (veh/h)         | 55                                                                                            | 5                                                                                 | 140                                                                               | 15   | 0                                                                                 | 5    | 135                                                                               | 1555                                                                              | 10   | 10                                                                                  | 1570                                                                                | 60                                                                                  |
| Number                        | 3                                                                                             | 8                                                                                 | 18                                                                                | 7    | 4                                                                                 | 14   | 1                                                                                 | 6                                                                                 | 16   | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                             | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 0.97                                                                                          |                                                                                   | 0.96                                                                              | 0.97 |                                                                                   | 0.96 | 1.00                                                                              |                                                                                   | 1.00 | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                                          | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                                          | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 60                                                                                            | 5                                                                                 | 6                                                                                 | 16   | 0                                                                                 | 1    | 147                                                                               | 1690                                                                              | 11   | 11                                                                                  | 1707                                                                                | 39                                                                                  |
| Adj No. of Lanes              | 0                                                                                             | 1                                                                                 | 1                                                                                 | 0    | 1                                                                                 | 0    | 1                                                                                 | 2                                                                                 | 0    | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                                          | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                             | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 229                                                                                           | 16                                                                                | 175                                                                               | 179  | 2                                                                                 | 7    | 179                                                                               | 2644                                                                              | 17   | 14                                                                                  | 2267                                                                                | 1014                                                                                |
| Arrive On Green               | 0.13                                                                                          | 0.12                                                                              | 0.12                                                                              | 0.13 | 0.00                                                                              | 0.12 | 0.10                                                                              | 0.73                                                                              | 0.73 | 0.01                                                                                | 0.64                                                                                | 0.64                                                                                |
| Sat Flow, veh/h               | 1376                                                                                          | 140                                                                               | 1521                                                                              | 936  | 18                                                                                | 60   | 1774                                                                              | 3605                                                                              | 23   | 1774                                                                                | 3539                                                                                | 1582                                                                                |
| Grp Volume(v), veh/h          | 65                                                                                            | 0                                                                                 | 6                                                                                 | 17   | 0                                                                                 | 0    | 147                                                                               | 829                                                                               | 872  | 11                                                                                  | 1707                                                                                | 39                                                                                  |
| Grp Sat Flow(s),veh/h/ln      | 1516                                                                                          | 0                                                                                 | 1521                                                                              | 1013 | 0                                                                                 | 0    | 1774                                                                              | 1770                                                                              | 1858 | 1774                                                                                | 1770                                                                                | 1582                                                                                |
| Q Serve(g_s), s               | 0.0                                                                                           | 0.0                                                                               | 0.3                                                                               | 0.9  | 0.0                                                                               | 0.0  | 7.9                                                                               | 22.9                                                                              | 23.0 | 0.6                                                                                 | 32.7                                                                                | 0.9                                                                                 |
| Cycle Q Clear(g_c), s         | 3.3                                                                                           | 0.0                                                                               | 0.3                                                                               | 4.3  | 0.0                                                                               | 0.0  | 7.9                                                                               | 22.9                                                                              | 23.0 | 0.6                                                                                 | 32.7                                                                                | 0.9                                                                                 |
| Prop In Lane                  | 0.92                                                                                          |                                                                                   | 1.00                                                                              | 0.94 |                                                                                   | 0.06 | 1.00                                                                              |                                                                                   | 0.01 | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 261                                                                                           | 0                                                                                 | 175                                                                               | 199  | 0                                                                                 | 0    | 179                                                                               | 1298                                                                              | 1363 | 14                                                                                  | 2267                                                                                | 1014                                                                                |
| V/C Ratio(X)                  | 0.25                                                                                          | 0.00                                                                              | 0.03                                                                              | 0.09 | 0.00                                                                              | 0.00 | 0.82                                                                              | 0.64                                                                              | 0.64 | 0.78                                                                                | 0.75                                                                                | 0.04                                                                                |
| Avail Cap(c_a), veh/h         | 429                                                                                           | 0                                                                                 | 359                                                                               | 363  | 0                                                                                 | 0    | 382                                                                               | 1560                                                                              | 1638 | 200                                                                                 | 2757                                                                                | 1232                                                                                |
| HCM Platoon Ratio             | 1.00                                                                                          | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                                          | 0.00                                                                              | 1.00                                                                              | 1.00 | 0.00                                                                              | 0.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 39.2                                                                                          | 0.0                                                                               | 38.4                                                                              | 40.7 | 0.0                                                                               | 0.0  | 43.0                                                                              | 6.5                                                                               | 6.5  | 48.3                                                                                | 12.2                                                                                | 6.5                                                                                 |
| Incr Delay (d2), s/veh        | 0.2                                                                                           | 0.0                                                                               | 0.0                                                                               | 0.1  | 0.0                                                                               | 0.0  | 3.6                                                                               | 1.2                                                                               | 1.2  | 28.5                                                                                | 1.4                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                                           | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 1.6                                                                                           | 0.0                                                                               | 0.1                                                                               | 0.4  | 0.0                                                                               | 0.0  | 4.1                                                                               | 11.5                                                                              | 12.1 | 0.4                                                                                 | 16.1                                                                                | 0.4                                                                                 |
| LnGrp Delay(d),s/veh          | 39.4                                                                                          | 0.0                                                                               | 38.4                                                                              | 40.7 | 0.0                                                                               | 0.0  | 46.6                                                                              | 7.7                                                                               | 7.7  | 76.8                                                                                | 13.6                                                                                | 6.5                                                                                 |
| LnGrp LOS                     | D                                                                                             |                                                                                   | D                                                                                 | D    |                                                                                   |      | D                                                                                 | A                                                                                 | A    | E                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h           | 71                                                                                            |                                                                                   |                                                                                   |      |                                                                                   | 17   |                                                                                   | 1848                                                                              |      | 1757                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 39.3                                                                                          |                                                                                   |                                                                                   |      |                                                                                   | 40.7 |                                                                                   | 10.8                                                                              |      | 13.8                                                                                |                                                                                     |                                                                                     |
| Approach LOS                  | D                                                                                             |                                                                                   |                                                                                   |      |                                                                                   | D    |                                                                                   | B                                                                                 |      | B                                                                                   |                                                                                     |                                                                                     |
| Timer                         | 1                                                                                             | 2                                                                                 | 3                                                                                 | 4    | 5                                                                                 | 6    | 7                                                                                 | 8                                                                                 |      |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                             | 2                                                                                 | 4                                                                                 |      | 5                                                                                 | 6    | 8                                                                                 |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 13.8                                                                                          | 67.5                                                                              | 16.2                                                                              |      | 4.8                                                                               | 76.6 | 16.2                                                                              |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                                           | 5.0                                                                               | 5.0                                                                               |      | 4.0                                                                               | 5.0  | 5.0                                                                               |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 21.0                                                                                          | 76.0                                                                              | 23.0                                                                              |      | 11.0                                                                              | 86.0 | 23.0                                                                              |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.9), s | 19.5                                                                                          | 34.7                                                                              | 6.3                                                                               |      | 2.6                                                                               | 25.0 | 5.3                                                                               |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.1                                                                                           | 27.8                                                                              | 0.0                                                                               |      | 0.0                                                                               | 33.7 | 0.1                                                                               |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                               |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           |                                                                                               |                                                                                   | 12.9                                                                              |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  |                                                                                               |                                                                                   | B                                                                                 |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 6: Honoapiilani Highway & Kai Ala Drive/Puukolii Road

10/05/2017

|                              |                                                                                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                              |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Movement                     | EBL                                                                                | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR  | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                    |  |  |  |  |      |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 80                                                                                 | 5                                                                                 | 175                                                                               | 70                                                                                | 5                                                                                 | 50   | 125                                                                               | 1535                                                                              | 60                                                                                | 35                                                                                  | 1720                                                                                | 100                                                                                 |
| Future Volume (veh/h)        | 80                                                                                 | 5                                                                                 | 175                                                                               | 70                                                                                | 5                                                                                 | 50   | 125                                                                               | 1535                                                                              | 60                                                                                | 35                                                                                  | 1720                                                                                | 100                                                                                 |
| Number                       | 3                                                                                  | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14   | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                  | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                               |                                                                                   | 0.99                                                                              | 0.99                                                                              |                                                                                   | 0.99 | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                               | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 87                                                                                 | 5                                                                                 | 37                                                                                | 76                                                                                | 5                                                                                 | 2    | 136                                                                               | 1668                                                                              | 49                                                                                | 38                                                                                  | 1870                                                                                | 86                                                                                  |
| Adj No. of Lanes             | 0                                                                                  | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0    | 1                                                                                 | 2                                                                                 | 1                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                               | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                  | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 217                                                                                | 11                                                                                | 211                                                                               | 140                                                                               | 170                                                                               | 68   | 157                                                                               | 2643                                                                              | 1182                                                                              | 49                                                                                  | 2427                                                                                | 1086                                                                                |
| Arrive On Green              | 0.14                                                                               | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13 | 0.09                                                                              | 0.75                                                                              | 0.75                                                                              | 0.03                                                                                | 0.69                                                                                | 0.69                                                                                |
| Sat Flow, veh/h              | 1296                                                                               | 79                                                                                | 1562                                                                              | 1346                                                                              | 1261                                                                              | 504  | 1774                                                                              | 3539                                                                              | 1582                                                                              | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 92                                                                                 | 0                                                                                 | 37                                                                                | 76                                                                                | 0                                                                                 | 7    | 136                                                                               | 1668                                                                              | 49                                                                                | 38                                                                                  | 1870                                                                                | 86                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1376                                                                               | 0                                                                                 | 1562                                                                              | 1346                                                                              | 0                                                                                 | 1766 | 1774                                                                              | 1770                                                                              | 1582                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 9.9                                                                                | 0.0                                                                               | 3.5                                                                               | 9.2                                                                               | 0.0                                                                               | 0.6  | 12.5                                                                              | 37.3                                                                              | 1.3                                                                               | 3.5                                                                                 | 58.1                                                                                | 3.0                                                                                 |
| Cycle Q Clear(g_c), s        | 10.5                                                                               | 0.0                                                                               | 3.5                                                                               | 19.6                                                                              | 0.0                                                                               | 0.6  | 12.5                                                                              | 37.3                                                                              | 1.3                                                                               | 3.5                                                                                 | 58.1                                                                                | 3.0                                                                                 |
| Prop In Lane                 | 0.95                                                                               |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.29 | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 236                                                                                | 0                                                                                 | 211                                                                               | 140                                                                               | 0                                                                                 | 238  | 157                                                                               | 2643                                                                              | 1182                                                                              | 49                                                                                  | 2427                                                                                | 1086                                                                                |
| V/C Ratio(X)                 | 0.39                                                                               | 0.00                                                                              | 0.18                                                                              | 0.54                                                                              | 0.00                                                                              | 0.03 | 0.86                                                                              | 0.63                                                                              | 0.04                                                                              | 0.78                                                                                | 0.77                                                                                | 0.08                                                                                |
| Avail Cap(c_a), veh/h        | 251                                                                                | 0                                                                                 | 227                                                                               | 154                                                                               | 0                                                                                 | 257  | 280                                                                               | 2643                                                                              | 1182                                                                              | 108                                                                                 | 2427                                                                                | 1086                                                                                |
| HCM Platoon Ratio            | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                               | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00 | 0.66                                                                              | 0.66                                                                              | 0.66                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 66.1                                                                               | 0.0                                                                               | 63.3                                                                              | 75.4                                                                              | 0.0                                                                               | 62.0 | 74.2                                                                              | 10.0                                                                              | 5.5                                                                               | 79.7                                                                                | 17.3                                                                                | 8.6                                                                                 |
| Incr Delay (d2), s/veh       | 1.0                                                                                | 0.0                                                                               | 0.4                                                                               | 3.3                                                                               | 0.0                                                                               | 0.0  | 3.6                                                                               | 0.8                                                                               | 0.0                                                                               | 9.3                                                                                 | 2.4                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                                | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 8.9                                                                                | 0.0                                                                               | 1.5                                                                               | 3.5                                                                               | 0.0                                                                               | 0.3  | 6.3                                                                               | 18.3                                                                              | 0.6                                                                               | 1.8                                                                                 | 28.9                                                                                | 1.3                                                                                 |
| LnGrp Delay(d),s/veh         | 67.1                                                                               | 0.0                                                                               | 63.7                                                                              | 78.7                                                                              | 0.0                                                                               | 62.1 | 77.8                                                                              | 10.8                                                                              | 5.5                                                                               | 89.0                                                                                | 19.7                                                                                | 8.8                                                                                 |
| LnGrp LOS                    | E                                                                                  |                                                                                   | E                                                                                 | E                                                                                 |                                                                                   | E    | E                                                                                 | B                                                                                 | A                                                                                 | F                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 129                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 83   |                                                                                   | 1853                                                                              |                                                                                   | 1994                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 66.1                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 77.3 |                                                                                   | 15.6                                                                              |                                                                                   | 20.6                                                                                |                                                                                     |                                                                                     |
| Approach LOS                 | E                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   | E    |                                                                                   | B                                                                                 |                                                                                   | C                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                  | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6    | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                  | 2                                                                                 |                                                                                   |                                                                                   | 4                                                                                 | 5    | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 18.6                                                                               | 119.1                                                                             |                                                                                   |                                                                                   | 27.2                                                                              | 8.6  | 129.2                                                                             | 27.2                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                                | 6.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 4.0  | 6.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 20.0                                                                               | 100.0                                                                             |                                                                                   |                                                                                   | 24.0                                                                              | 10.0 | 116.0                                                                             | 24.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+14), s | 14.5                                                                               | 60.1                                                                              |                                                                                   |                                                                                   | 21.6                                                                              | 5.5  | 39.3                                                                              | 12.5                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.2                                                                                | 30.4                                                                              |                                                                                   |                                                                                   | 0.0                                                                               | 0.0  | 38.6                                                                              | 0.3                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                    |                                                                                   | 20.9                                                                              |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                    |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 7: Honoapiilani Highway & Kaanapali Parkway/Halelo Street

10/05/2017

|                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|--------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                       | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations            |  |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)         | 310                                                                               | 5                                                                                 | 615                                                                               | 15                                                                                | 0                                                                                 | 5                                                                                 | 385                                                                               | 1565                                                                              | 10                                                                                | 80                                                                                  | 1750                                                                                | 140                                                                                 |
| Future Volume (veh/h)          | 310                                                                               | 5                                                                                 | 615                                                                               | 15                                                                                | 0                                                                                 | 5                                                                                 | 385                                                                               | 1565                                                                              | 10                                                                                | 80                                                                                  | 1750                                                                                | 140                                                                                 |
| Number                         | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)            | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 0.96                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln         | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h           | 341                                                                               | 0                                                                                 | 464                                                                               | 16                                                                                | 0                                                                                 | 1                                                                                 | 418                                                                               | 1701                                                                              | 11                                                                                | 87                                                                                  | 1902                                                                                | 131                                                                                 |
| Adj No. of Lanes               | 2                                                                                 | 0                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 2                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor               | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %           | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                     | 526                                                                               | 0                                                                                 | 897                                                                               | 68                                                                                | 0                                                                                 | 4                                                                                 | 487                                                                               | 2430                                                                              | 16                                                                                | 117                                                                                 | 2119                                                                                | 1175                                                                                |
| Arrive On Green                | 0.15                                                                              | 0.00                                                                              | 0.14                                                                              | 0.04                                                                              | 0.00                                                                              | 0.03                                                                              | 0.14                                                                              | 0.67                                                                              | 0.67                                                                              | 0.07                                                                                | 0.60                                                                                | 0.60                                                                                |
| Sat Flow, veh/h                | 3548                                                                              | 0                                                                                 | 3123                                                                              | 1653                                                                              | 0                                                                                 | 103                                                                               | 3442                                                                              | 3605                                                                              | 23                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h           | 341                                                                               | 0                                                                                 | 464                                                                               | 17                                                                                | 0                                                                                 | 0                                                                                 | 418                                                                               | 834                                                                               | 878                                                                               | 87                                                                                  | 1902                                                                                | 131                                                                                 |
| Grp Sat Flow(s),veh/h/ln       | 1774                                                                              | 0                                                                                 | 1561                                                                              | 1756                                                                              | 0                                                                                 | 0                                                                                 | 1721                                                                              | 1770                                                                              | 1859                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s                | 20.5                                                                              | 0.0                                                                               | 28.2                                                                              | 2.1                                                                               | 0.0                                                                               | 0.0                                                                               | 26.8                                                                              | 65.7                                                                              | 65.9                                                                              | 10.9                                                                                | 105.4                                                                               | 5.3                                                                                 |
| Cycle Q Clear(g_c), s          | 20.5                                                                              | 0.0                                                                               | 28.2                                                                              | 2.1                                                                               | 0.0                                                                               | 0.0                                                                               | 26.8                                                                              | 65.7                                                                              | 65.9                                                                              | 10.9                                                                                | 105.4                                                                               | 5.3                                                                                 |
| Prop In Lane                   | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.94                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                              |                                                                                   | 0.01                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h         | 526                                                                               | 0                                                                                 | 897                                                                               | 72                                                                                | 0                                                                                 | 0                                                                                 | 487                                                                               | 1193                                                                              | 1253                                                                              | 117                                                                                 | 2119                                                                                | 1175                                                                                |
| V/C Ratio(X)                   | 0.65                                                                              | 0.00                                                                              | 0.52                                                                              | 0.24                                                                              | 0.00                                                                              | 0.00                                                                              | 0.86                                                                              | 0.70                                                                              | 0.70                                                                              | 0.74                                                                                | 0.90                                                                                | 0.11                                                                                |
| Avail Cap(c_a), veh/h          | 534                                                                               | 0                                                                                 | 904                                                                               | 241                                                                               | 0                                                                                 | 0                                                                                 | 883                                                                               | 1519                                                                              | 1596                                                                              | 118                                                                                 | 2365                                                                                | 1286                                                                                |
| HCM Platoon Ratio              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)             | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh       | 90.7                                                                              | 0.0                                                                               | 67.8                                                                              | 105.0                                                                             | 0.0                                                                               | 0.0                                                                               | 94.8                                                                              | 22.7                                                                              | 22.7                                                                              | 103.7                                                                               | 39.3                                                                                | 8.2                                                                                 |
| Incr Delay (d2), s/veh         | 2.1                                                                               | 0.0                                                                               | 0.2                                                                               | 0.6                                                                               | 0.0                                                                               | 0.0                                                                               | 1.8                                                                               | 1.3                                                                               | 1.3                                                                               | 19.9                                                                                | 4.9                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh      | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln       | 10.2                                                                              | 0.0                                                                               | 12.2                                                                              | 1.0                                                                               | 0.0                                                                               | 0.0                                                                               | 12.9                                                                              | 32.4                                                                              | 34.1                                                                              | 6.0                                                                                 | 52.7                                                                                | 3.6                                                                                 |
| LnGrp Delay(d),s/veh           | 92.8                                                                              | 0.0                                                                               | 68.0                                                                              | 105.7                                                                             | 0.0                                                                               | 0.0                                                                               | 96.6                                                                              | 24.0                                                                              | 24.0                                                                              | 123.6                                                                               | 44.3                                                                                | 8.2                                                                                 |
| LnGrp LOS                      | F                                                                                 |                                                                                   | E                                                                                 | F                                                                                 |                                                                                   |                                                                                   | F                                                                                 | C                                                                                 | C                                                                                 | F                                                                                   | D                                                                                   | A                                                                                   |
| Approach Vol, veh/h            | 805                                                                               |                                                                                   |                                                                                   |                                                                                   | 17                                                                                |                                                                                   |                                                                                   | 2130                                                                              |                                                                                   |                                                                                     | 2120                                                                                |                                                                                     |
| Approach Delay, s/veh          | 78.5                                                                              |                                                                                   |                                                                                   |                                                                                   | 105.7                                                                             |                                                                                   |                                                                                   | 38.2                                                                              |                                                                                   |                                                                                     | 45.3                                                                                |                                                                                     |
| Approach LOS                   | E                                                                                 |                                                                                   |                                                                                   |                                                                                   | F                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                     | D                                                                                   |                                                                                     |
| Timer                          | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                   | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s       | 36.0                                                                              | 139.3                                                                             |                                                                                   | 13.3                                                                              | 18.9                                                                              | 156.4                                                                             |                                                                                   | 37.5                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s        | 6.0                                                                               | 6.0                                                                               |                                                                                   | 7.0                                                                               | 6.0                                                                               | 6.0                                                                               |                                                                                   | 7.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s    | 56.6                                                                              | 149.0                                                                             |                                                                                   | 28.0                                                                              | 13.0                                                                              | 192.0                                                                             |                                                                                   | 31.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+20.8), s | 29.8                                                                              | 107.4                                                                             |                                                                                   | 4.1                                                                               | 12.9                                                                              | 67.9                                                                              |                                                                                   | 30.2                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s        | 1.1                                                                               | 25.9                                                                              |                                                                                   | 0.0                                                                               | 0.0                                                                               | 25.3                                                                              |                                                                                   | 0.3                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay            | 47.8                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 8: Honoapiilani Highway & Leialii Parkway

10/05/2017

|                               |                                                                                    |       |      |      |      |       |      |      |      |      |      |      |
|-------------------------------|------------------------------------------------------------------------------------|-------|------|------|------|-------|------|------|------|------|------|------|
|                               |  |       |      |      |      |       |      |      |      |      |      |      |
| Movement                      | EBL                                                                                | EBT   | EBR  | WBL  | WBT  | WBR   | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations           |                                                                                    | ↕     |      | ↗    | ↖    |       | ↗    | ↕    |      | ↗    | ↕    |      |
| Traffic Volume (veh/h)        | 10                                                                                 | 0     | 5    | 90   | 5    | 60    | 10   | 1895 | 90   | 90   | 2310 | 5    |
| Future Volume (veh/h)         | 10                                                                                 | 0     | 5    | 90   | 5    | 60    | 10   | 1895 | 90   | 90   | 2310 | 5    |
| Number                        | 3                                                                                  | 8     | 18   | 7    | 4    | 14    | 1    | 6    | 16   | 5    | 2    | 12   |
| Initial Q (Qb), veh           | 0                                                                                  | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                               |       | 1.00 | 1.00 |      | 1.00  | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Parking Bus, Adj              | 1.00                                                                               | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln        | 1900                                                                               | 1863  | 1900 | 1863 | 1863 | 1900  | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h          | 11                                                                                 | 0     | 1    | 98   | 5    | 2     | 11   | 2060 | 96   | 98   | 2511 | 5    |
| Adj No. of Lanes              | 0                                                                                  | 1     | 0    | 1    | 1    | 0     | 1    | 2    | 0    | 1    | 2    | 0    |
| Peak Hour Factor              | 0.92                                                                               | 0.92  | 0.92 | 0.92 | 0.92 | 0.92  | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, %          | 2                                                                                  | 2     | 2    | 2    | 2    | 2     | 2    | 2    | 2    | 2    | 2    | 2    |
| Cap, veh/h                    | 156                                                                                | 2     | 10   | 176  | 110  | 44    | 22   | 2624 | 121  | 122  | 2964 | 6    |
| Arrive On Green               | 0.09                                                                               | 0.00  | 0.08 | 0.09 | 0.09 | 0.08  | 0.02 | 1.00 | 1.00 | 0.07 | 0.82 | 0.81 |
| Sat Flow, veh/h               | 1244                                                                               | 24    | 115  | 1410 | 1267 | 507   | 1774 | 3445 | 159  | 1774 | 3624 | 7    |
| Grp Volume(v), veh/h          | 12                                                                                 | 0     | 0    | 98   | 0    | 7     | 11   | 1050 | 1106 | 98   | 1226 | 1290 |
| Grp Sat Flow(s),veh/h/ln      | 1384                                                                               | 0     | 0    | 1410 | 0    | 1773  | 1774 | 1770 | 1835 | 1774 | 1770 | 1861 |
| Q Serve(g_s), s               | 0.9                                                                                | 0.0   | 0.0  | 8.1  | 0.0  | 0.5   | 0.9  | 0.0  | 0.0  | 7.9  | 59.5 | 59.6 |
| Cycle Q Clear(g_c), s         | 1.4                                                                                | 0.0   | 0.0  | 9.5  | 0.0  | 0.5   | 0.9  | 0.0  | 0.0  | 7.9  | 59.5 | 59.6 |
| Prop In Lane                  | 0.92                                                                               |       | 0.08 | 1.00 |      | 0.29  | 1.00 |      | 0.09 | 1.00 |      | 0.00 |
| Lane Grp Cap(c), veh/h        | 168                                                                                | 0     | 0    | 176  | 0    | 154   | 22   | 1348 | 1397 | 122  | 1447 | 1522 |
| V/C Ratio(X)                  | 0.07                                                                               | 0.00  | 0.00 | 0.56 | 0.00 | 0.05  | 0.50 | 0.78 | 0.79 | 0.80 | 0.85 | 0.85 |
| Avail Cap(c_a), veh/h         | 279                                                                                | 0     | 0    | 287  | 0    | 294   | 61   | 1348 | 1397 | 184  | 1447 | 1522 |
| HCM Platoon Ratio             | 1.00                                                                               | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I)            | 1.00                                                                               | 0.00  | 0.00 | 1.00 | 0.00 | 1.00  | 0.56 | 0.56 | 0.56 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh      | 61.2                                                                               | 0.0   | 0.0  | 64.6 | 0.0  | 60.8  | 70.3 | 0.0  | 0.0  | 66.6 | 7.8  | 7.8  |
| Incr Delay (d2), s/veh        | 0.2                                                                                | 0.0   | 0.0  | 2.7  | 0.0  | 0.1   | 3.7  | 2.6  | 2.7  | 8.0  | 6.3  | 6.0  |
| Initial Q Delay(d3),s/veh     | 0.0                                                                                | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln      | 0.5                                                                                | 0.0   | 0.0  | 4.0  | 0.0  | 0.3   | 0.5  | 1.0  | 1.0  | 4.1  | 30.8 | 32.7 |
| LnGrp Delay(d),s/veh          | 61.4                                                                               | 0.0   | 0.0  | 67.4 | 0.0  | 60.9  | 73.9 | 2.6  | 2.7  | 74.5 | 14.1 | 13.9 |
| LnGrp LOS                     | E                                                                                  |       |      | E    |      | E     | E    | A    | A    | E    | B    | B    |
| Approach Vol, veh/h           | 12                                                                                 |       |      | 105  |      |       | 2167 |      |      | 2614 |      |      |
| Approach Delay, s/veh         | 61.4                                                                               |       |      | 66.9 |      |       | 3.0  |      |      | 16.3 |      |      |
| Approach LOS                  | E                                                                                  |       |      | E    |      |       | A    |      |      | B    |      |      |
| Timer                         | 1                                                                                  | 2     | 3    | 4    | 5    | 6     | 7    | 8    |      |      |      |      |
| Assigned Phs                  | 1                                                                                  | 2     |      | 4    | 5    | 6     |      | 8    |      |      |      |      |
| Phs Duration (G+Y+Rc), s      | 5.8                                                                                | 122.6 |      | 16.6 | 14.0 | 114.4 |      | 16.6 |      |      |      |      |
| Change Period (Y+Rc), s       | 4.0                                                                                | 5.0   |      | 5.0  | 4.0  | 5.0   |      | 5.0  |      |      |      |      |
| Max Green Setting (Gmax), s   | 5.0                                                                                | 103.0 |      | 23.0 | 15.0 | 93.0  |      | 23.0 |      |      |      |      |
| Max Q Clear Time (g_c+1.2), s | 12.5                                                                               | 61.6  |      | 11.5 | 9.9  | 2.0   |      | 3.4  |      |      |      |      |
| Green Ext Time (p_c), s       | 0.0                                                                                | 39.2  |      | 0.2  | 0.1  | 66.4  |      | 0.0  |      |      |      |      |
| Intersection Summary          |                                                                                    |       |      |      |      |       |      |      |      |      |      |      |
| HCM 2010 Ctrl Delay           |                                                                                    |       | 11.6 |      |      |       |      |      |      |      |      |      |
| HCM 2010 LOS                  |                                                                                    |       | B    |      |      |       |      |      |      |      |      |      |

# HCM 2010 Signalized Intersection Summary

## 9: Honoapiilani Highway & Front Street/Flemming Road

10/05/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |  |   |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                   |  |                                                                                   |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)        | 185                                                                               | 15                                                                                | 10                                                                                | 60                                                                                | 5                                                                                 | 10                                                                                | 5                                                                                 | 1810                                                                              | 20                                                                                | 5                                                                                   | 1960                                                                                | 335                                                                                 |
| Future Volume (veh/h)         | 185                                                                               | 15                                                                                | 10                                                                                | 60                                                                                | 5                                                                                 | 10                                                                                | 5                                                                                 | 1810                                                                              | 20                                                                                | 5                                                                                   | 1960                                                                                | 335                                                                                 |
| Number                        | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 201                                                                               | 16                                                                                | 9                                                                                 | 65                                                                                | 5                                                                                 | 7                                                                                 | 5                                                                                 | 1967                                                                              | 21                                                                                | 5                                                                                   | 2130                                                                                | 285                                                                                 |
| Adj No. of Lanes              | 0                                                                                 | 1                                                                                 | 0                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 273                                                                               | 18                                                                                | 10                                                                                | 281                                                                               | 22                                                                                | 26                                                                                | 7                                                                                 | 2662                                                                              | 28                                                                                | 7                                                                                   | 2627                                                                                | 1175                                                                                |
| Arrive On Green               | 0.17                                                                              | 0.17                                                                              | 0.16                                                                              | 0.17                                                                              | 0.17                                                                              | 0.16                                                                              | 0.01                                                                              | 0.99                                                                              | 0.98                                                                              | 0.00                                                                                | 0.74                                                                                | 0.74                                                                                |
| Sat Flow, veh/h               | 1322                                                                              | 105                                                                               | 59                                                                                | 1371                                                                              | 130                                                                               | 150                                                                               | 1774                                                                              | 3587                                                                              | 38                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h          | 226                                                                               | 0                                                                                 | 0                                                                                 | 77                                                                                | 0                                                                                 | 0                                                                                 | 5                                                                                 | 969                                                                               | 1019                                                                              | 5                                                                                   | 2130                                                                                | 285                                                                                 |
| Grp Sat Flow(s),veh/h/ln      | 1486                                                                              | 0                                                                                 | 0                                                                                 | 1651                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                              | 1770                                                                              | 1856                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s               | 15.7                                                                              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 3.8                                                                               | 3.9                                                                               | 0.4                                                                                 | 56.5                                                                                | 8.2                                                                                 |
| Cycle Q Clear(g_c), s         | 21.4                                                                              | 0.0                                                                               | 0.0                                                                               | 5.7                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 3.8                                                                               | 3.9                                                                               | 0.4                                                                                 | 56.5                                                                                | 8.2                                                                                 |
| Prop In Lane                  | 0.89                                                                              |                                                                                   | 0.04                                                                              | 0.84                                                                              |                                                                                   | 0.09                                                                              | 1.00                                                                              |                                                                                   | 0.02                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 302                                                                               | 0                                                                                 | 0                                                                                 | 329                                                                               | 0                                                                                 | 0                                                                                 | 7                                                                                 | 1313                                                                              | 1377                                                                              | 7                                                                                   | 2627                                                                                | 1175                                                                                |
| V/C Ratio(X)                  | 0.75                                                                              | 0.00                                                                              | 0.00                                                                              | 0.23                                                                              | 0.00                                                                              | 0.00                                                                              | 0.75                                                                              | 0.74                                                                              | 0.74                                                                              | 0.75                                                                                | 0.81                                                                                | 0.24                                                                                |
| Avail Cap(c_a), veh/h         | 362                                                                               | 0                                                                                 | 0                                                                                 | 389                                                                               | 0                                                                                 | 0                                                                                 | 37                                                                                | 1313                                                                              | 1377                                                                              | 37                                                                                  | 2627                                                                                | 1175                                                                                |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.33                                                                              | 1.33                                                                              | 1.33                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.56                                                                              | 0.56                                                                              | 0.56                                                                              | 0.37                                                                                | 0.37                                                                                | 0.37                                                                                |
| Uniform Delay (d), s/veh      | 58.3                                                                              | 0.0                                                                               | 0.0                                                                               | 52.2                                                                              | 0.0                                                                               | 0.0                                                                               | 72.1                                                                              | 0.3                                                                               | 0.3                                                                               | 72.2                                                                                | 12.1                                                                                | 5.9                                                                                 |
| Incr Delay (d2), s/veh        | 6.9                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 28.5                                                                              | 2.1                                                                               | 2.0                                                                               | 20.0                                                                                | 1.1                                                                                 | 0.2                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 2.7                                                                               | 0.0                                                                               | 0.0                                                                               | 0.3                                                                               | 1.5                                                                               | 1.6                                                                               | 0.2                                                                                 | 27.6                                                                                | 3.6                                                                                 |
| LnGrp Delay(d),s/veh          | 65.2                                                                              | 0.0                                                                               | 0.0                                                                               | 52.5                                                                              | 0.0                                                                               | 0.0                                                                               | 100.6                                                                             | 2.4                                                                               | 2.3                                                                               | 92.2                                                                                | 13.2                                                                                | 6.1                                                                                 |
| LnGrp LOS                     | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | F                                                                                 | A                                                                                 | A                                                                                 | F                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h           |                                                                                   | 226                                                                               |                                                                                   |                                                                                   | 77                                                                                |                                                                                   |                                                                                   | 1993                                                                              |                                                                                   |                                                                                     | 2420                                                                                |                                                                                     |
| Approach Delay, s/veh         |                                                                                   | 65.2                                                                              |                                                                                   |                                                                                   | 52.5                                                                              |                                                                                   |                                                                                   | 2.6                                                                               |                                                                                   |                                                                                     | 12.5                                                                                |                                                                                     |
| Approach LOS                  |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 4.5                                                                               | 111.6                                                                             |                                                                                   | 28.8                                                                              | 4.5                                                                               | 111.6                                                                             |                                                                                   | 28.8                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 3.0                                                                               | 98.0                                                                              |                                                                                   | 30.0                                                                              | 3.0                                                                               | 98.0                                                                              |                                                                                   | 30.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.2), s | 12.4                                                                              | 58.5                                                                              |                                                                                   | 7.7                                                                               | 2.4                                                                               | 5.9                                                                               |                                                                                   | 23.4                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.0                                                                               | 37.4                                                                              |                                                                                   | 0.2                                                                               | 0.0                                                                               | 72.7                                                                              |                                                                                   | 0.5                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           | 11.5                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 10: Honoapiilani Highway & Kapunakea Street

10/05/2017

|                              | <div></div> |                                                                                   |                                                                                   |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------|
| Movement                     | EBL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR   | NBL                                                                               | NBT                                                                               | NBR  | SBL                                                                                 | SBT                                                                                 | SBR  |
| Lane Configurations          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |  |  |  |       |  |  |      |  |  |      |
| Traffic Volume (veh/h)       | 185                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 35                                                                                | 45                                                                                | 95                                                                                | 25                                                                                | 20    | 55                                                                                | 1605                                                                              | 105  | 30                                                                                  | 1890                                                                                | 155  |
| Future Volume (veh/h)        | 185                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 35                                                                                | 45                                                                                | 95                                                                                | 25                                                                                | 20    | 55                                                                                | 1605                                                                              | 105  | 30                                                                                  | 1890                                                                                | 155  |
| Number                       | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14    | 1                                                                                 | 6                                                                                 | 16   | 5                                                                                   | 2                                                                                   | 12   |
| Initial Q (Qb), veh          | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0     | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   | 0                                                                                   | 0    |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                   | 0.98                                                                              | 0.99                                                                              |                                                                                   | 0.98  | 1.00                                                                              |                                                                                   | 1.00 | 1.00                                                                                |                                                                                     | 1.00 |
| Parking Bus, Adj             | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00  | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00 |
| Adj Sat Flow, veh/h/ln       | 1900                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900  | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                                | 1863                                                                                | 1900 |
| Adj Flow Rate, veh/h         | 201                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 38                                                                                | 10                                                                                | 103                                                                               | 27                                                                                | 2     | 60                                                                                | 1745                                                                              | 111  | 33                                                                                  | 2054                                                                                | 164  |
| Adj No. of Lanes             | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0     | 1                                                                                 | 2                                                                                 | 0    | 1                                                                                   | 2                                                                                   | 0    |
| Peak Hour Factor             | 0.92                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92  | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                                | 0.92                                                                                | 0.92 |
| Percent Heavy Veh, %         | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2     | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                   | 2                                                                                   | 2    |
| Cap, veh/h                   | 267                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 42                                                                                | 309                                                                               | 355                                                                               | 342                                                                               | 25    | 73                                                                                | 2345                                                                              | 148  | 42                                                                                  | 2247                                                                                | 177  |
| Arrive On Green              | 0.20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.19  | 0.08                                                                              | 1.00                                                                              | 1.00 | 0.05                                                                                | 1.00                                                                                | 1.00 |
| Sat Flow, veh/h              | 1107                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 209                                                                               | 1545                                                                              | 1347                                                                              | 1710                                                                              | 127   | 1774                                                                              | 3381                                                                              | 213  | 1774                                                                                | 3323                                                                                | 262  |
| Grp Volume(v), veh/h         | 239                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0                                                                                 | 10                                                                                | 103                                                                               | 0                                                                                 | 29    | 60                                                                                | 906                                                                               | 950  | 33                                                                                  | 1081                                                                                | 1137 |
| Grp Sat Flow(s),veh/h/ln     | 1317                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0                                                                                 | 1545                                                                              | 1347                                                                              | 0                                                                                 | 1837  | 1774                                                                              | 1770                                                                              | 1825 | 1774                                                                                | 1770                                                                                | 1816 |
| Q Serve(g_s), s              | 24.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.0                                                                               | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 1.9   | 4.8                                                                               | 0.0                                                                               | 0.0  | 2.7                                                                                 | 0.0                                                                                 | 0.0  |
| Cycle Q Clear(g_c), s        | 26.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.0                                                                               | 0.8                                                                               | 8.3                                                                               | 0.0                                                                               | 1.9   | 4.8                                                                               | 0.0                                                                               | 0.0  | 2.7                                                                                 | 0.0                                                                                 | 0.0  |
| Prop In Lane                 | 0.84                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.07  | 1.00                                                                              |                                                                                   | 0.12 | 1.00                                                                                |                                                                                     | 0.14 |
| Lane Grp Cap(c), veh/h       | 309                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0                                                                                 | 309                                                                               | 355                                                                               | 0                                                                                 | 367   | 73                                                                                | 1228                                                                              | 1266 | 42                                                                                  | 1196                                                                                | 1227 |
| V/C Ratio(X)                 | 0.77                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.00                                                                              | 0.03                                                                              | 0.29                                                                              | 0.00                                                                              | 0.08  | 0.82                                                                              | 0.74                                                                              | 0.75 | 0.79                                                                                | 0.90                                                                                | 0.93 |
| Avail Cap(c_a), veh/h        | 309                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0                                                                                 | 309                                                                               | 355                                                                               | 0                                                                                 | 367   | 73                                                                                | 1228                                                                              | 1266 | 73                                                                                  | 1196                                                                                | 1227 |
| HCM Platoon Ratio            | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00  | 2.00                                                                              | 2.00                                                                              | 2.00 | 2.00                                                                                | 2.00                                                                                | 2.00 |
| Upstream Filter(I)           | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00  | 0.30                                                                              | 0.30                                                                              | 0.30 | 0.47                                                                                | 0.47                                                                                | 0.47 |
| Uniform Delay (d), s/veh     | 57.7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.0                                                                               | 46.7                                                                              | 49.7                                                                              | 0.0                                                                               | 47.2  | 66.0                                                                              | 0.0                                                                               | 0.0  | 68.7                                                                                | 0.0                                                                                 | 0.0  |
| Incr Delay (d2), s/veh       | 11.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.1   | 18.0                                                                              | 1.2                                                                               | 1.3  | 5.6                                                                                 | 5.9                                                                                 | 7.2  |
| Initial Q Delay(d3),s/veh    | 0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0   | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                                 | 0.0                                                                                 | 0.0  |
| %ile BackOfQ(50%),veh/ln     | 10.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.0                                                                               | 0.3                                                                               | 3.6                                                                               | 0.0                                                                               | 1.0   | 2.7                                                                               | 0.4                                                                               | 0.4  | 1.4                                                                                 | 2.0                                                                                 | 2.5  |
| LnGrp Delay(d),s/veh         | 69.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.0                                                                               | 46.8                                                                              | 50.2                                                                              | 0.0                                                                               | 47.3  | 83.9                                                                              | 1.2                                                                               | 1.3  | 74.3                                                                                | 5.9                                                                                 | 7.2  |
| LnGrp LOS                    | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                   | D                                                                                 | D                                                                                 |                                                                                   | D     | F                                                                                 | A                                                                                 | A    | E                                                                                   | A                                                                                   | A    |
| Approach Vol, veh/h          | 249                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 132   |                                                                                   | 1916                                                                              |      | 2251                                                                                |                                                                                     |      |
| Approach Delay, s/veh        | 68.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 49.5  |                                                                                   | 3.8                                                                               |      | 7.6                                                                                 |                                                                                     |      |
| Approach LOS                 | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   | D     |                                                                                   | A                                                                                 |      | A                                                                                   |                                                                                     |      |
| Timer                        | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6     | 7                                                                                 | 8                                                                                 |      |                                                                                     |                                                                                     |      |
| Assigned Phs                 | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2                                                                                 | 4                                                                                 |                                                                                   | 5                                                                                 | 6     | 8                                                                                 |                                                                                   |      |                                                                                     |                                                                                     |      |
| Phs Duration (G+Y+Rc), s     | 10.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 102.0                                                                             | 33.0                                                                              |                                                                                   | 7.4                                                                               | 104.6 | 33.0                                                                              |                                                                                   |      |                                                                                     |                                                                                     |      |
| Change Period (Y+Rc), s      | 4.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 5.0                                                                               | 5.0                                                                               |                                                                                   | 4.0                                                                               | 5.0   | 5.0                                                                               |                                                                                   |      |                                                                                     |                                                                                     |      |
| Max Green Setting (Gmax), s  | 97.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                   | 28.0                                                                              |                                                                                   | 6.0                                                                               | 97.0  | 28.0                                                                              |                                                                                   |      |                                                                                     |                                                                                     |      |
| Max Q Clear Time (g_c+10), s | 10.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 2.0                                                                               | 10.3                                                                              |                                                                                   | 4.7                                                                               | 2.0   | 28.0                                                                              |                                                                                   |      |                                                                                     |                                                                                     |      |
| Green Ext Time (p_c), s      | 0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 69.9                                                                              | 0.4                                                                               |                                                                                   | 0.0                                                                               | 48.1  | 0.0                                                                               |                                                                                   |      |                                                                                     |                                                                                     |      |
| Intersection Summary         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| HCM 2010 Ctrl Delay          | 10.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| HCM 2010 LOS                 | B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| Notes                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |

# HCM 2010 Signalized Intersection Summary

## 11: Honoapiilani Highway & Keawe Street

10/05/2017

|                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                              |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 65                                                                                | 185                                                                               | 60                                                                                | 125                                                                               | 110                                                                               | 725                                                                               | 55                                                                                | 980                                                                               | 195                                                                               | 645                                                                                 | 1255                                                                                | 65                                                                                  |
| Future Volume (veh/h)        | 65                                                                                | 185                                                                               | 60                                                                                | 125                                                                               | 110                                                                               | 725                                                                               | 55                                                                                | 980                                                                               | 195                                                                               | 645                                                                                 | 1255                                                                                | 65                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                                |                                                                                     | 0.99                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 71                                                                                | 201                                                                               | 12                                                                                | 136                                                                               | 120                                                                               | 475                                                                               | 60                                                                                | 1065                                                                              | 133                                                                               | 701                                                                                 | 1364                                                                                | 69                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 2                                                                                 | 1                                                                                 | 2                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 110                                                                               | 262                                                                               | 367                                                                               | 231                                                                               | 609                                                                               | 509                                                                               | 77                                                                                | 1326                                                                              | 588                                                                               | 741                                                                                 | 1875                                                                                | 95                                                                                  |
| Arrive On Green              | 0.24                                                                              | 0.24                                                                              | 0.24                                                                              | 0.06                                                                              | 0.33                                                                              | 0.33                                                                              | 0.04                                                                              | 0.37                                                                              | 0.37                                                                              | 0.43                                                                                | 1.00                                                                                | 1.00                                                                                |
| Sat Flow, veh/h              | 330                                                                               | 1104                                                                              | 1547                                                                              | 1774                                                                              | 1863                                                                              | 1557                                                                              | 1774                                                                              | 3539                                                                              | 1571                                                                              | 3442                                                                                | 3428                                                                                | 173                                                                                 |
| Grp Volume(v), veh/h         | 272                                                                               | 0                                                                                 | 12                                                                                | 136                                                                               | 120                                                                               | 475                                                                               | 60                                                                                | 1065                                                                              | 133                                                                               | 701                                                                                 | 703                                                                                 | 730                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1435                                                                              | 0                                                                                 | 1547                                                                              | 1774                                                                              | 1863                                                                              | 1557                                                                              | 1774                                                                              | 1770                                                                              | 1571                                                                              | 1721                                                                                | 1770                                                                                | 1831                                                                                |
| Q Serve(g_s), s              | 22.4                                                                              | 0.0                                                                               | 0.9                                                                               | 8.3                                                                               | 6.7                                                                               | 42.8                                                                              | 4.9                                                                               | 39.0                                                                              | 8.4                                                                               | 28.4                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Cycle Q Clear(g_c), s        | 25.5                                                                              | 0.0                                                                               | 0.9                                                                               | 8.3                                                                               | 6.7                                                                               | 42.8                                                                              | 4.9                                                                               | 39.0                                                                              | 8.4                                                                               | 28.4                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Prop In Lane                 | 0.26                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 0.09                                                                                |
| Lane Grp Cap(c), veh/h       | 372                                                                               | 0                                                                                 | 367                                                                               | 231                                                                               | 609                                                                               | 509                                                                               | 77                                                                                | 1326                                                                              | 588                                                                               | 741                                                                                 | 968                                                                                 | 1001                                                                                |
| V/C Ratio(X)                 | 0.73                                                                              | 0.00                                                                              | 0.03                                                                              | 0.59                                                                              | 0.20                                                                              | 0.93                                                                              | 0.78                                                                              | 0.80                                                                              | 0.23                                                                              | 0.95                                                                                | 0.73                                                                                | 0.73                                                                                |
| Avail Cap(c_a), veh/h        | 416                                                                               | 0                                                                                 | 416                                                                               | 231                                                                               | 668                                                                               | 558                                                                               | 110                                                                               | 1326                                                                              | 588                                                                               | 807                                                                                 | 968                                                                                 | 1001                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.88                                                                              | 0.88                                                                              | 0.88                                                                              | 0.28                                                                                | 0.28                                                                                | 0.28                                                                                |
| Uniform Delay (d), s/veh     | 51.5                                                                              | 0.0                                                                               | 42.5                                                                              | 40.0                                                                              | 35.1                                                                              | 47.2                                                                              | 68.7                                                                              | 40.6                                                                              | 31.0                                                                              | 40.4                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Incr Delay (d2), s/veh       | 5.7                                                                               | 0.0                                                                               | 0.0                                                                               | 3.9                                                                               | 0.2                                                                               | 21.8                                                                              | 11.0                                                                              | 4.6                                                                               | 0.8                                                                               | 7.0                                                                                 | 1.4                                                                                 | 1.3                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 10.8                                                                              | 0.0                                                                               | 0.4                                                                               | 4.3                                                                               | 3.5                                                                               | 21.5                                                                              | 2.6                                                                               | 19.9                                                                              | 3.7                                                                               | 14.1                                                                                | 0.4                                                                                 | 0.4                                                                                 |
| LnGrp Delay(d),s/veh         | 57.2                                                                              | 0.0                                                                               | 42.5                                                                              | 43.8                                                                              | 35.2                                                                              | 69.0                                                                              | 79.7                                                                              | 45.2                                                                              | 31.8                                                                              | 47.4                                                                                | 1.4                                                                                 | 1.3                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 | D                                                                                 | E                                                                                 | E                                                                                 | D                                                                                 | C                                                                                 | D                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 284                                                                               |                                                                                   |                                                                                   |                                                                                   | 731                                                                               |                                                                                   |                                                                                   |                                                                                   | 1258                                                                              |                                                                                     | 2134                                                                                |                                                                                     |
| Approach Delay, s/veh        | 56.6                                                                              |                                                                                   |                                                                                   |                                                                                   | 58.8                                                                              |                                                                                   |                                                                                   |                                                                                   | 45.4                                                                              |                                                                                     | 16.5                                                                                |                                                                                     |
| Approach LOS                 | E                                                                                 |                                                                                   |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 30.3                                                                              | 83.3                                                                              | 13.0                                                                              | 38.4                                                                              | 35.2                                                                              | 58.3                                                                              | 51.4                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 71.0                                                                              | 8.0                                                                               | 38.0                                                                              | 34.0                                                                              | 46.0                                                                              | 51.0                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+10), s | 10.5                                                                              | 2.0                                                                               | 10.3                                                                              | 27.5                                                                              | 30.4                                                                              | 41.0                                                                              | 44.8                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 25.6                                                                              | 0.0                                                                               | 1.0                                                                               | 0.9                                                                               | 3.7                                                                               | 1.6                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 34.3                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

HCM 2010 TWSC  
12: RIRO Access & Honoapiilani Highway

10/05/2017

| Intersection             |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
|--------------------------|--------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh         | 0.5    |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
| Movement                 | WBL    | WBR                                                                               | NBT                                                                               | NBR                                                                               | SBL    | SBT                                                                                 |
| Lane Configurations      |        |  |  |  |        |  |
| Traffic Vol, veh/h       | 0      | 50                                                                                | 900                                                                               | 65                                                                                | 0      | 845                                                                                 |
| Future Vol, veh/h        | 0      | 50                                                                                | 900                                                                               | 65                                                                                | 0      | 845                                                                                 |
| Conflicting Peds, #/hr   | 0      | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0      | 0                                                                                   |
| Sign Control             | Stop   | Stop                                                                              | Free                                                                              | Free                                                                              | Free   | Free                                                                                |
| RT Channelized           | -      | None                                                                              | -                                                                                 | None                                                                              | -      | None                                                                                |
| Storage Length           | -      | 0                                                                                 | -                                                                                 | 0                                                                                 | -      | -                                                                                   |
| Veh in Median Storage, # | 0      | -                                                                                 | 0                                                                                 | -                                                                                 | -      | 0                                                                                   |
| Grade, %                 | 0      | -                                                                                 | 0                                                                                 | -                                                                                 | -      | 0                                                                                   |
| Peak Hour Factor         | 92     | 92                                                                                | 92                                                                                | 92                                                                                | 92     | 92                                                                                  |
| Heavy Vehicles, %        | 2      | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2      | 2                                                                                   |
| Mvmt Flow                | 0      | 54                                                                                | 978                                                                               | 71                                                                                | 0      | 918                                                                                 |
|                          |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
| Major/Minor              | Minor1 |                                                                                   | Major1                                                                            |                                                                                   | Major2 |                                                                                     |
| Conflicting Flow All     | -      | 978                                                                               | 0                                                                                 | 0                                                                                 | -      | -                                                                                   |
| Stage 1                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Stage 2                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Critical Hdwy            | -      | 6.22                                                                              | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Critical Hdwy Stg 1      | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Critical Hdwy Stg 2      | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Follow-up Hdwy           | -      | 3.318                                                                             | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Pot Cap-1 Maneuver       | 0      | 304                                                                               | -                                                                                 | -                                                                                 | 0      | -                                                                                   |
| Stage 1                  | 0      | -                                                                                 | -                                                                                 | -                                                                                 | 0      | -                                                                                   |
| Stage 2                  | 0      | -                                                                                 | -                                                                                 | -                                                                                 | 0      | -                                                                                   |
| Platoon blocked, %       |        |                                                                                   | -                                                                                 | -                                                                                 |        | -                                                                                   |
| Mov Cap-1 Maneuver       | -      | 304                                                                               | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Mov Cap-2 Maneuver       | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Stage 1                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Stage 2                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
|                          |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
|                          |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
| Approach                 | WB     |                                                                                   | NB                                                                                |                                                                                   | SB     |                                                                                     |
| HCM Control Delay, s     | 19.4   |                                                                                   | 0                                                                                 |                                                                                   | 0      |                                                                                     |
| HCM LOS                  | C      |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
|                          |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
| Minor Lane/Major Mvmt    | NBT    | NBRWBLn1                                                                          | SBT                                                                               |                                                                                   |        |                                                                                     |
| Capacity (veh/h)         | -      | - 304                                                                             | -                                                                                 |                                                                                   |        |                                                                                     |
| HCM Lane V/C Ratio       | -      | - 0.179                                                                           | -                                                                                 |                                                                                   |        |                                                                                     |
| HCM Control Delay (s)    | -      | - 19.4                                                                            | -                                                                                 |                                                                                   |        |                                                                                     |
| HCM Lane LOS             | -      | - C                                                                               | -                                                                                 |                                                                                   |        |                                                                                     |
| HCM 95th %tile Q(veh)    | -      | - 0.6                                                                             | -                                                                                 |                                                                                   |        |                                                                                     |

HCM 2010 TWSC  
14: Road A & Akahele Street

10/05/2017

Intersection

Int Delay, s/veh 6.9

| Movement                 | EBL                                                                               | EBT                                                                               | EBR  | WBL                                                                               | WBT                                                                               | WBR  | NBL  | NBT                                                                                 | NBR  | SBL  | SBT                                                                                 | SBR  |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|------|-------------------------------------------------------------------------------------|------|------|-------------------------------------------------------------------------------------|------|
| Lane Configurations      |  |  |      |  |  |      |      |  |      |      |  |      |
| Traffic Vol, veh/h       | 115                                                                               | 70                                                                                | 75   | 5                                                                                 | 60                                                                                | 10   | 65   | 10                                                                                  | 15   | 30   | 10                                                                                  | 100  |
| Future Vol, veh/h        | 115                                                                               | 70                                                                                | 75   | 5                                                                                 | 60                                                                                | 10   | 65   | 10                                                                                  | 15   | 30   | 10                                                                                  | 100  |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0    | 0                                                                                   | 0    | 0    | 0                                                                                   | 0    |
| Sign Control             | Free                                                                              | Free                                                                              | Free | Free                                                                              | Free                                                                              | Free | Stop | Stop                                                                                | Stop | Stop | Stop                                                                                | Stop |
| RT Channelized           | -                                                                                 | -                                                                                 | None | -                                                                                 | -                                                                                 | None | -    | -                                                                                   | None | -    | -                                                                                   | None |
| Storage Length           | 100                                                                               | -                                                                                 | -    | 100                                                                               | -                                                                                 | -    | -    | -                                                                                   | -    | -    | -                                                                                   | -    |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | -    | -                                                                                 | 0                                                                                 | -    | -    | 0                                                                                   | -    | -    | 0                                                                                   | -    |
| Grade, %                 | -                                                                                 | 0                                                                                 | -    | -                                                                                 | 0                                                                                 | -    | -    | 0                                                                                   | -    | -    | 0                                                                                   | -    |
| Peak Hour Factor         | 92                                                                                | 92                                                                                | 92   | 92                                                                                | 92                                                                                | 92   | 92   | 92                                                                                  | 92   | 92   | 92                                                                                  | 92   |
| Heavy Vehicles, %        | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    | 2    | 2                                                                                   | 2    | 2    | 2                                                                                   | 2    |
| Mvmt Flow                | 125                                                                               | 76                                                                                | 82   | 5                                                                                 | 65                                                                                | 11   | 71   | 11                                                                                  | 16   | 33   | 11                                                                                  | 109  |

| Major/Minor          | Major1 |   |   | Major2 |   |   | Minor1 |       |       | Minor2 |       |       |
|----------------------|--------|---|---|--------|---|---|--------|-------|-------|--------|-------|-------|
| Conflicting Flow All | 76     | 0 | 0 | 158    | 0 | 0 | 508    | 453   | 117   | 462    | 489   | 71    |
| Stage 1              | -      | - | - | -      | - | - | 367    | 367   | -     | 81     | 81    | -     |
| Stage 2              | -      | - | - | -      | - | - | 141    | 86    | -     | 381    | 408   | -     |
| Critical Hdwy        | 4.12   | - | - | 4.12   | - | - | 7.12   | 6.52  | 6.22  | 7.12   | 6.52  | 6.22  |
| Critical Hdwy Stg 1  | -      | - | - | -      | - | - | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Critical Hdwy Stg 2  | -      | - | - | -      | - | - | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Follow-up Hdwy       | 2.218  | - | - | 2.218  | - | - | 3.518  | 4.018 | 3.318 | 3.518  | 4.018 | 3.318 |
| Pot Cap-1 Maneuver   | 1523   | - | - | 1422   | - | - | 475    | 503   | 935   | 510    | 480   | 991   |
| Stage 1              | -      | - | - | -      | - | - | 653    | 622   | -     | 927    | 828   | -     |
| Stage 2              | -      | - | - | -      | - | - | 862    | 824   | -     | 641    | 597   | -     |
| Platoon blocked, %   |        | - | - |        | - | - |        |       |       |        |       |       |
| Mov Cap-1 Maneuver   | 1523   | - | - | 1422   | - | - | 388    | 460   | 935   | 460    | 439   | 991   |
| Mov Cap-2 Maneuver   | -      | - | - | -      | - | - | 388    | 460   | -     | 460    | 439   | -     |
| Stage 1              | -      | - | - | -      | - | - | 599    | 571   | -     | 851    | 825   | -     |
| Stage 2              | -      | - | - | -      | - | - | 755    | 821   | -     | 567    | 548   | -     |

| Approach             | EB  | WB  | NB   | SB   |
|----------------------|-----|-----|------|------|
| HCM Control Delay, s | 3.4 | 0.5 | 15.6 | 11.1 |
| HCM LOS              |     |     | C    | B    |

| Minor Lane/Major Mvmt | NBLn1 | EBL   | EBT | EBR | WBL   | WBT | WBR | SBLn1 |
|-----------------------|-------|-------|-----|-----|-------|-----|-----|-------|
| Capacity (veh/h)      | 438   | 1523  | -   | -   | 1422  | -   | -   | 741   |
| HCM Lane V/C Ratio    | 0.223 | 0.082 | -   | -   | 0.004 | -   | -   | 0.205 |
| HCM Control Delay (s) | 15.6  | 7.6   | -   | -   | 7.5   | -   | -   | 11.1  |
| HCM Lane LOS          | C     | A     | -   | -   | A     | -   | -   | B     |
| HCM 95th %tile Q(veh) | 0.8   | 0.3   | -   | -   | 0     | -   | -   | 0.8   |

| Intersection             |        |       |      |        |       |      |        |       |       |        |       |       |
|--------------------------|--------|-------|------|--------|-------|------|--------|-------|-------|--------|-------|-------|
| Int Delay, s/veh         | 4.3    |       |      |        |       |      |        |       |       |        |       |       |
| Movement                 | EBL    | EBT   | EBR  | WBL    | WBT   | WBR  | NBL    | NBT   | NBR   | SBL    | SBT   | SBR   |
| Lane Configurations      |        | ↕     |      |        | ↕     |      |        | ↕     |       |        | ↕     |       |
| Traffic Vol, veh/h       | 25     | 15    | 75   | 5      | 20    | 5    | 40     | 5     | 5     | 5      | 5     | 15    |
| Future Vol, veh/h        | 25     | 15    | 75   | 5      | 20    | 5    | 40     | 5     | 5     | 5      | 5     | 15    |
| Conflicting Peds, #/hr   | 0      | 0     | 0    | 0      | 0     | 0    | 0      | 0     | 0     | 0      | 0     | 0     |
| Sign Control             | Free   | Free  | Free | Free   | Free  | Free | Stop   | Stop  | Stop  | Stop   | Stop  | Stop  |
| RT Channelized           | -      | -     | None | -      | -     | None | -      | -     | None  | -      | -     | None  |
| Storage Length           | -      | -     | -    | -      | -     | -    | -      | -     | -     | -      | -     | -     |
| Veh in Median Storage, # | -      | 0     | -    | -      | 0     | -    | -      | 0     | -     | -      | 0     | -     |
| Grade, %                 | -      | 0     | -    | -      | 0     | -    | -      | 0     | -     | -      | 0     | -     |
| Peak Hour Factor         | 92     | 92    | 92   | 92     | 92    | 92   | 92     | 92    | 92    | 92     | 92    | 92    |
| Heavy Vehicles, %        | 2      | 2     | 2    | 2      | 2     | 2    | 2      | 2     | 2     | 2      | 2     | 2     |
| Mvmt Flow                | 27     | 16    | 82   | 5      | 22    | 5    | 43     | 5     | 5     | 5      | 5     | 16    |
|                          |        |       |      |        |       |      |        |       |       |        |       |       |
| Major/Minor              | Major1 |       |      | Major2 |       |      | Minor1 |       |       | Minor2 |       |       |
| Conflicting Flow All     | 27     | 0     | 0    | 98     | 0     | 0    | 156    | 148   | 57    | 151    | 187   | 25    |
| Stage 1                  | -      | -     | -    | -      | -     | -    | 111    | 111   | -     | 35     | 35    | -     |
| Stage 2                  | -      | -     | -    | -      | -     | -    | 45     | 37    | -     | 116    | 152   | -     |
| Critical Hdwy            | 4.12   | -     | -    | 4.12   | -     | -    | 7.12   | 6.52  | 6.22  | 7.12   | 6.52  | 6.22  |
| Critical Hdwy Stg 1      | -      | -     | -    | -      | -     | -    | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Critical Hdwy Stg 2      | -      | -     | -    | -      | -     | -    | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Follow-up Hdwy           | 2.218  | -     | -    | 2.218  | -     | -    | 3.518  | 4.018 | 3.318 | 3.518  | 4.018 | 3.318 |
| Pot Cap-1 Maneuver       | 1587   | -     | -    | 1495   | -     | -    | 810    | 743   | 1009  | 816    | 708   | 1051  |
| Stage 1                  | -      | -     | -    | -      | -     | -    | 894    | 804   | -     | 981    | 866   | -     |
| Stage 2                  | -      | -     | -    | -      | -     | -    | 969    | 864   | -     | 889    | 772   | -     |
| Platoon blocked, %       |        | -     | -    |        | -     | -    |        |       |       |        |       |       |
| Mov Cap-1 Maneuver       | 1587   | -     | -    | 1495   | -     | -    | 780    | 727   | 1009  | 794    | 693   | 1051  |
| Mov Cap-2 Maneuver       | -      | -     | -    | -      | -     | -    | 780    | 727   | -     | 794    | 693   | -     |
| Stage 1                  | -      | -     | -    | -      | -     | -    | 878    | 790   | -     | 963    | 863   | -     |
| Stage 2                  | -      | -     | -    | -      | -     | -    | 945    | 861   | -     | 862    | 758   | -     |
|                          |        |       |      |        |       |      |        |       |       |        |       |       |
| Approach                 | EB     |       |      | WB     |       |      | NB     |       |       | SB     |       |       |
| HCM Control Delay, s     | 1.6    |       |      | 1.2    |       |      | 9.9    |       |       | 9.1    |       |       |
| HCM LOS                  |        |       |      |        |       |      | A      |       |       | A      |       |       |
|                          |        |       |      |        |       |      |        |       |       |        |       |       |
| Minor Lane/Major Mvmt    | NBLn1  | EBL   | EBT  | EBR    | WBL   | WBT  | WBR    | SBLn1 |       |        |       |       |
| Capacity (veh/h)         | 792    | 1587  | -    | -      | 1495  | -    | -      | 900   |       |        |       |       |
| HCM Lane V/C Ratio       | 0.069  | 0.017 | -    | -      | 0.004 | -    | -      | 0.03  |       |        |       |       |
| HCM Control Delay (s)    | 9.9    | 7.3   | 0    | -      | 7.4   | 0    | -      | 9.1   |       |        |       |       |
| HCM Lane LOS             | A      | A     | A    | -      | A     | A    | -      | A     |       |        |       |       |
| HCM 95th %tile O(veh)    | 0.2    | 0.1   | -    | -      | 0     | -    | -      | 0.1   |       |        |       |       |



---

## **APPENDIX C**

### LEVEL OF SERVICE CALCULATIONS

- Future Year 2022 Scenario 2 WE Peak
-



# HCM 2010 Signalized Intersection Summary

## 1: Napilihau Street

10/05/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 40                                                                                | 45                                                                                | 370                                                                               | 45                                                                                | 50                                                                                | 20                                                                                | 315                                                                                | 355                                                                                 | 40                                                                                  | 20                                                                                  | 315                                                                                 | 90                                                                                  |
| Future Volume (veh/h)        | 40                                                                                | 45                                                                                | 370                                                                               | 45                                                                                | 50                                                                                | 20                                                                                | 315                                                                                | 355                                                                                 | 40                                                                                  | 20                                                                                  | 315                                                                                 | 90                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                  | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.99                                                                              | 0.99                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 43                                                                                | 49                                                                                | 34                                                                                | 49                                                                                | 54                                                                                | 10                                                                                | 342                                                                                | 386                                                                                 | 25                                                                                  | 22                                                                                  | 342                                                                                 | 28                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 175                                                                               | 119                                                                               | 188                                                                               | 232                                                                               | 184                                                                               | 34                                                                                | 427                                                                                | 985                                                                                 | 836                                                                                 | 28                                                                                  | 567                                                                                 | 481                                                                                 |
| Arrive On Green              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.24                                                                               | 0.53                                                                                | 0.53                                                                                | 0.02                                                                                | 0.30                                                                                | 0.30                                                                                |
| Sat Flow, veh/h              | 534                                                                               | 993                                                                               | 1564                                                                              | 1299                                                                              | 1526                                                                              | 283                                                                               | 1774                                                                               | 1863                                                                                | 1580                                                                                | 1774                                                                                | 1863                                                                                | 1581                                                                                |
| Grp Volume(v), veh/h         | 92                                                                                | 0                                                                                 | 34                                                                                | 49                                                                                | 0                                                                                 | 64                                                                                | 342                                                                                | 386                                                                                 | 25                                                                                  | 22                                                                                  | 342                                                                                 | 28                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1527                                                                              | 0                                                                                 | 1564                                                                              | 1299                                                                              | 0                                                                                 | 1809                                                                              | 1774                                                                               | 1863                                                                                | 1580                                                                                | 1774                                                                                | 1863                                                                                | 1581                                                                                |
| Q Serve(g_s), s              | 1.2                                                                               | 0.0                                                                               | 0.9                                                                               | 1.8                                                                               | 0.0                                                                               | 1.5                                                                               | 8.7                                                                                | 5.9                                                                                 | 0.4                                                                                 | 0.6                                                                                 | 7.5                                                                                 | 0.6                                                                                 |
| Cycle Q Clear(g_c), s        | 2.8                                                                               | 0.0                                                                               | 0.9                                                                               | 4.5                                                                               | 0.0                                                                               | 1.5                                                                               | 8.7                                                                                | 5.9                                                                                 | 0.4                                                                                 | 0.6                                                                                 | 7.5                                                                                 | 0.6                                                                                 |
| Prop In Lane                 | 0.47                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.16                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 294                                                                               | 0                                                                                 | 188                                                                               | 232                                                                               | 0                                                                                 | 218                                                                               | 427                                                                                | 985                                                                                 | 836                                                                                 | 28                                                                                  | 567                                                                                 | 481                                                                                 |
| V/C Ratio(X)                 | 0.31                                                                              | 0.00                                                                              | 0.18                                                                              | 0.21                                                                              | 0.00                                                                              | 0.29                                                                              | 0.80                                                                               | 0.39                                                                                | 0.03                                                                                | 0.78                                                                                | 0.60                                                                                | 0.06                                                                                |
| Avail Cap(c_a), veh/h        | 891                                                                               | 0                                                                                 | 786                                                                               | 728                                                                               | 0                                                                                 | 908                                                                               | 1114                                                                               | 3079                                                                                | 2612                                                                                | 557                                                                                 | 2494                                                                                | 2117                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 19.6                                                                              | 0.0                                                                               | 18.9                                                                              | 21.8                                                                              | 0.0                                                                               | 19.2                                                                              | 17.1                                                                               | 6.7                                                                                 | 5.4                                                                                 | 23.4                                                                                | 14.2                                                                                | 11.8                                                                                |
| Incr Delay (d2), s/veh       | 0.6                                                                               | 0.0                                                                               | 0.5                                                                               | 0.4                                                                               | 0.0                                                                               | 0.7                                                                               | 3.5                                                                                | 0.5                                                                                 | 0.0                                                                                 | 35.9                                                                                | 2.2                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.2                                                                               | 0.0                                                                               | 0.4                                                                               | 0.7                                                                               | 0.0                                                                               | 0.8                                                                               | 4.6                                                                                | 3.2                                                                                 | 0.2                                                                                 | 0.6                                                                                 | 4.1                                                                                 | 0.3                                                                                 |
| LnGrp Delay(d),s/veh         | 20.2                                                                              | 0.0                                                                               | 19.4                                                                              | 22.3                                                                              | 0.0                                                                               | 19.9                                                                              | 20.6                                                                               | 7.2                                                                                 | 5.4                                                                                 | 59.3                                                                                | 16.4                                                                                | 11.9                                                                                |
| LnGrp LOS                    | C                                                                                 |                                                                                   | B                                                                                 | C                                                                                 |                                                                                   | B                                                                                 | C                                                                                  | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 126                                                                               |                                                                                   |                                                                                   | 113                                                                               |                                                                                   |                                                                                    | 753                                                                                 |                                                                                     |                                                                                     | 392                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 20.0                                                                              |                                                                                   |                                                                                   | 20.9                                                                              |                                                                                   |                                                                                    | 13.2                                                                                |                                                                                     |                                                                                     | 18.5                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.8                                                                               | 31.3                                                                              |                                                                                   | 10.7                                                                              | 16.5                                                                              | 20.5                                                                              |                                                                                    | 10.7                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 79.0                                                                              |                                                                                   | 24.0                                                                              | 30.0                                                                              | 64.0                                                                              |                                                                                    | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.6                                                                               | 7.9                                                                               |                                                                                   | 4.8                                                                               | 10.7                                                                              | 9.5                                                                               |                                                                                    | 6.5                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 5.7                                                                               |                                                                                   | 0.5                                                                               | 1.0                                                                               | 4.8                                                                               |                                                                                    | 0.4                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 16.0                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 2: Hoohui Road

10/05/2017

|                                |                                                                                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|--------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Movement                       | EBL                                                                                | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR  | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations            |                                                                                    |  |  |  |  |      |  |  |  |  |  |  |
| Traffic Volume (veh/h)         | 55                                                                                 | 20                                                                                | 230                                                                               | 45                                                                                | 15                                                                                | 5    | 160                                                                               | 540                                                                               | 30                                                                                | 15                                                                                  | 565                                                                                 | 60                                                                                  |
| Future Volume (veh/h)          | 55                                                                                 | 20                                                                                | 230                                                                               | 45                                                                                | 15                                                                                | 5    | 160                                                                               | 540                                                                               | 30                                                                                | 15                                                                                  | 565                                                                                 | 60                                                                                  |
| Number                         | 7                                                                                  | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18   | 5                                                                                 | 2                                                                                 | 12                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh            | 0                                                                                  | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)            | 0.98                                                                               |                                                                                   | 0.98                                                                              | 0.99                                                                              |                                                                                   | 0.98 | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj               | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln         | 1900                                                                               | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h           | 60                                                                                 | 22                                                                                | 21                                                                                | 49                                                                                | 16                                                                                | 1    | 174                                                                               | 587                                                                               | 0                                                                                 | 16                                                                                  | 614                                                                                 | 27                                                                                  |
| Adj No. of Lanes               | 0                                                                                  | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0    | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor               | 0.92                                                                               | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %           | 2                                                                                  | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                     | 268                                                                                | 78                                                                                | 219                                                                               | 280                                                                               | 244                                                                               | 15   | 428                                                                               | 941                                                                               | 800                                                                               | 404                                                                                 | 796                                                                                 | 674                                                                                 |
| Arrive On Green                | 0.14                                                                               | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14 | 0.09                                                                              | 0.51                                                                              | 0.00                                                                              | 0.01                                                                                | 0.43                                                                                | 0.43                                                                                |
| Sat Flow, veh/h                | 959                                                                                | 556                                                                               | 1555                                                                              | 1339                                                                              | 1733                                                                              | 108  | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1578                                                                                |
| Grp Volume(v), veh/h           | 82                                                                                 | 0                                                                                 | 21                                                                                | 49                                                                                | 0                                                                                 | 17   | 174                                                                               | 587                                                                               | 0                                                                                 | 16                                                                                  | 614                                                                                 | 27                                                                                  |
| Grp Sat Flow(s),veh/h/ln       | 1515                                                                               | 0                                                                                 | 1555                                                                              | 1339                                                                              | 0                                                                                 | 1841 | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1578                                                                                |
| Q Serve(g_s), s                | 1.4                                                                                | 0.0                                                                               | 0.6                                                                               | 1.6                                                                               | 0.0                                                                               | 0.4  | 2.4                                                                               | 10.7                                                                              | 0.0                                                                               | 0.2                                                                                 | 13.2                                                                                | 0.5                                                                                 |
| Cycle Q Clear(g_c), s          | 2.2                                                                                | 0.0                                                                               | 0.6                                                                               | 3.8                                                                               | 0.0                                                                               | 0.4  | 2.4                                                                               | 10.7                                                                              | 0.0                                                                               | 0.2                                                                                 | 13.2                                                                                | 0.5                                                                                 |
| Prop In Lane                   | 0.73                                                                               |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.06 | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h         | 347                                                                                | 0                                                                                 | 219                                                                               | 280                                                                               | 0                                                                                 | 259  | 428                                                                               | 941                                                                               | 800                                                                               | 404                                                                                 | 796                                                                                 | 674                                                                                 |
| V/C Ratio(X)                   | 0.24                                                                               | 0.00                                                                              | 0.10                                                                              | 0.17                                                                              | 0.00                                                                              | 0.07 | 0.41                                                                              | 0.62                                                                              | 0.00                                                                              | 0.04                                                                                | 0.77                                                                                | 0.04                                                                                |
| Avail Cap(c_a), veh/h          | 925                                                                                | 0                                                                                 | 830                                                                               | 807                                                                               | 0                                                                                 | 983  | 836                                                                               | 2029                                                                              | 1724                                                                              | 951                                                                                 | 2029                                                                                | 1718                                                                                |
| HCM Platoon Ratio              | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)             | 1.00                                                                               | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh       | 18.2                                                                               | 0.0                                                                               | 17.5                                                                              | 19.9                                                                              | 0.0                                                                               | 17.4 | 8.3                                                                               | 8.4                                                                               | 0.0                                                                               | 8.0                                                                                 | 11.5                                                                                | 7.8                                                                                 |
| Incr Delay (d2), s/veh         | 0.3                                                                                | 0.0                                                                               | 0.2                                                                               | 0.3                                                                               | 0.0                                                                               | 0.1  | 0.6                                                                               | 0.7                                                                               | 0.0                                                                               | 0.0                                                                                 | 1.6                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh      | 0.0                                                                                | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln       | 1.0                                                                                | 0.0                                                                               | 0.2                                                                               | 0.6                                                                               | 0.0                                                                               | 0.2  | 1.2                                                                               | 5.6                                                                               | 0.0                                                                               | 0.1                                                                                 | 7.0                                                                                 | 0.2                                                                                 |
| LnGrp Delay(d),s/veh           | 18.5                                                                               | 0.0                                                                               | 17.7                                                                              | 20.2                                                                              | 0.0                                                                               | 17.5 | 8.9                                                                               | 9.0                                                                               | 0.0                                                                               | 8.0                                                                                 | 13.1                                                                                | 7.8                                                                                 |
| LnGrp LOS                      | B                                                                                  |                                                                                   | B                                                                                 | C                                                                                 |                                                                                   | B    | A                                                                                 | A                                                                                 |                                                                                   | A                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h            | 103                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 66   |                                                                                   | 761                                                                               |                                                                                   | 657                                                                                 |                                                                                     |                                                                                     |
| Approach Delay, s/veh          | 18.3                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 19.5 |                                                                                   | 9.0                                                                               |                                                                                   | 12.7                                                                                |                                                                                     |                                                                                     |
| Approach LOS                   | B                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   | B    |                                                                                   | A                                                                                 |                                                                                   | B                                                                                   |                                                                                     |                                                                                     |
| Timer                          | 1                                                                                  | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6    | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                   | 1                                                                                  | 2                                                                                 | 4                                                                                 |                                                                                   | 5                                                                                 | 6    | 8                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s       | 5.6                                                                                | 29.7                                                                              | 11.6                                                                              |                                                                                   | 9.2                                                                               | 26.0 | 11.6                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s        | 5.0                                                                                | 6.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 6.0  | 5.0                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s    | 15.0                                                                               | 51.0                                                                              | 25.0                                                                              |                                                                                   | 15.0                                                                              | 51.0 | 25.0                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+12.2), s | 12.2                                                                               | 12.7                                                                              | 4.2                                                                               |                                                                                   | 4.4                                                                               | 15.2 | 5.8                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s        | 0.0                                                                                | 4.3                                                                               | 0.4                                                                               |                                                                                   | 0.3                                                                               | 4.6  | 0.2                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary           |                                                                                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay            |                                                                                    |                                                                                   | 11.6                                                                              |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                   |                                                                                    |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 3: Honoapiilani Highway & Akahele Street

10/05/2017

|                              |  |  |  |  |  |  |  |  |    |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 45                                                                                | 70                                                                                | 85                                                                                | 205                                                                               | 75                                                                                | 85                                                                                | 80                                                                                | 615                                                                               | 170                                                                                 | 155                                                                                 | 645                                                                                 | 50                                                                                  |
| Future Volume (veh/h)        | 45                                                                                | 70                                                                                | 85                                                                                | 205                                                                               | 75                                                                                | 85                                                                                | 80                                                                                | 615                                                                               | 170                                                                                 | 155                                                                                 | 645                                                                                 | 50                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                 | 2                                                                                 | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 49                                                                                | 76                                                                                | 60                                                                                | 223                                                                               | 82                                                                                | 16                                                                                | 87                                                                                | 668                                                                               | 118                                                                                 | 168                                                                                 | 701                                                                                 | 21                                                                                  |
| Adj No. of Lanes             | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 63                                                                                | 107                                                                               | 84                                                                                | 261                                                                               | 415                                                                               | 353                                                                               | 114                                                                               | 764                                                                               | 649                                                                                 | 206                                                                                 | 861                                                                                 | 731                                                                                 |
| Arrive On Green              | 0.04                                                                              | 0.11                                                                              | 0.11                                                                              | 0.15                                                                              | 0.22                                                                              | 0.22                                                                              | 0.06                                                                              | 0.41                                                                              | 0.41                                                                                | 0.12                                                                                | 0.46                                                                                | 0.46                                                                                |
| Sat Flow, veh/h              | 1774                                                                              | 959                                                                               | 757                                                                               | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1582                                                                                |
| Grp Volume(v), veh/h         | 49                                                                                | 0                                                                                 | 136                                                                               | 223                                                                               | 82                                                                                | 16                                                                                | 87                                                                                | 668                                                                               | 118                                                                                 | 168                                                                                 | 701                                                                                 | 21                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1774                                                                              | 0                                                                                 | 1717                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1582                                                                                |
| Q Serve(g_s), s              | 2.5                                                                               | 0.0                                                                               | 7.1                                                                               | 11.4                                                                              | 3.3                                                                               | 0.7                                                                               | 4.5                                                                               | 30.7                                                                              | 4.4                                                                                 | 8.6                                                                                 | 30.2                                                                                | 0.7                                                                                 |
| Cycle Q Clear(g_c), s        | 2.5                                                                               | 0.0                                                                               | 7.1                                                                               | 11.4                                                                              | 3.3                                                                               | 0.7                                                                               | 4.5                                                                               | 30.7                                                                              | 4.4                                                                                 | 8.6                                                                                 | 30.2                                                                                | 0.7                                                                                 |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 0.44                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 63                                                                                | 0                                                                                 | 191                                                                               | 261                                                                               | 415                                                                               | 353                                                                               | 114                                                                               | 764                                                                               | 649                                                                                 | 206                                                                                 | 861                                                                                 | 731                                                                                 |
| V/C Ratio(X)                 | 0.78                                                                              | 0.00                                                                              | 0.71                                                                              | 0.85                                                                              | 0.20                                                                              | 0.05                                                                              | 0.77                                                                              | 0.87                                                                              | 0.18                                                                                | 0.81                                                                                | 0.81                                                                                | 0.03                                                                                |
| Avail Cap(c_a), veh/h        | 382                                                                               | 0                                                                                 | 388                                                                               | 382                                                                               | 421                                                                               | 358                                                                               | 477                                                                               | 1303                                                                              | 1107                                                                                | 477                                                                                 | 1303                                                                                | 1106                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 44.4                                                                              | 0.0                                                                               | 39.9                                                                              | 38.6                                                                              | 29.4                                                                              | 28.3                                                                              | 42.8                                                                              | 25.2                                                                              | 17.5                                                                                | 40.1                                                                                | 21.6                                                                                | 13.6                                                                                |
| Incr Delay (d2), s/veh       | 18.0                                                                              | 0.0                                                                               | 4.8                                                                               | 11.8                                                                              | 0.2                                                                               | 0.1                                                                               | 10.2                                                                              | 3.7                                                                               | 0.1                                                                                 | 7.6                                                                                 | 2.5                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.6                                                                               | 0.0                                                                               | 3.6                                                                               | 6.4                                                                               | 1.7                                                                               | 0.3                                                                               | 2.5                                                                               | 16.5                                                                              | 2.0                                                                                 | 4.6                                                                                 | 16.0                                                                                | 0.3                                                                                 |
| LnGrp Delay(d),s/veh         | 62.4                                                                              | 0.0                                                                               | 44.7                                                                              | 50.5                                                                              | 29.6                                                                              | 28.4                                                                              | 53.0                                                                              | 28.9                                                                              | 17.6                                                                                | 47.7                                                                                | 24.0                                                                                | 13.6                                                                                |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 | C                                                                                 | C                                                                                 | D                                                                                 | C                                                                                 | B                                                                                   | D                                                                                   | C                                                                                   | B                                                                                   |
| Approach Vol, veh/h          | 185                                                                               |                                                                                   |                                                                                   |                                                                                   | 321                                                                               |                                                                                   |                                                                                   |                                                                                   | 873                                                                                 |                                                                                     | 890                                                                                 |                                                                                     |
| Approach Delay, s/veh        | 49.4                                                                              |                                                                                   |                                                                                   |                                                                                   | 44.0                                                                              |                                                                                   |                                                                                   |                                                                                   | 29.8                                                                                |                                                                                     | 28.2                                                                                |                                                                                     |
| Approach LOS                 | D                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   | C                                                                                   |                                                                                     | C                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 15.8                                                                              | 43.1                                                                              | 18.7                                                                              | 15.3                                                                              | 11.0                                                                              | 48.0                                                                              | 8.3                                                                               | 25.7                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+10), s | 10.6                                                                              | 32.7                                                                              | 13.4                                                                              | 9.1                                                                               | 6.5                                                                               | 32.2                                                                              | 4.5                                                                               | 5.3                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.4                                                                               | 5.4                                                                               | 0.3                                                                               | 0.5                                                                               | 0.2                                                                               | 5.5                                                                               | 0.1                                                                               | 0.3                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 32.8                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 4: Honoapiilani Highway & Lower Honoapiilani Road

10/05/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)        | 70                                                                                | 10                                                                                | 595                                                                               | 10                                                                                | 0                                                                                 | 5                                                                                 | 410                                                                               | 795                                                                               | 5                                                                                 | 0                                                                                   | 885                                                                                 | 65                                                                                  |
| Future Volume (veh/h)         | 70                                                                                | 10                                                                                | 595                                                                               | 10                                                                                | 0                                                                                 | 5                                                                                 | 410                                                                               | 795                                                                               | 5                                                                                 | 0                                                                                   | 885                                                                                 | 65                                                                                  |
| Number                        | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 76                                                                                | 11                                                                                | 0                                                                                 | 11                                                                                | 0                                                                                 | 1                                                                                 | 446                                                                               | 864                                                                               | 5                                                                                 | 0                                                                                   | 962                                                                                 | 33                                                                                  |
| Adj No. of Lanes              | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 194                                                                               | 14                                                                                | 120                                                                               | 210                                                                               | 4                                                                                 | 10                                                                                | 504                                                                               | 2766                                                                              | 16                                                                                | 3                                                                                   | 1506                                                                                | 671                                                                                 |
| Arrive On Green               | 0.09                                                                              | 0.08                                                                              | 0.00                                                                              | 0.09                                                                              | 0.00                                                                              | 0.08                                                                              | 0.28                                                                              | 0.77                                                                              | 0.77                                                                              | 0.00                                                                                | 0.43                                                                                | 0.43                                                                                |
| Sat Flow, veh/h               | 1287                                                                              | 186                                                                               | 1583                                                                              | 1459                                                                              | 48                                                                                | 137                                                                               | 1774                                                                              | 3608                                                                              | 21                                                                                | 1774                                                                                | 3539                                                                                | 1578                                                                                |
| Grp Volume(v), veh/h          | 87                                                                                | 0                                                                                 | 0                                                                                 | 12                                                                                | 0                                                                                 | 0                                                                                 | 446                                                                               | 424                                                                               | 445                                                                               | 0                                                                                   | 962                                                                                 | 33                                                                                  |
| Grp Sat Flow(s),veh/h/ln      | 1473                                                                              | 0                                                                                 | 1583                                                                              | 1645                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                              | 1770                                                                              | 1859                                                                              | 1774                                                                                | 1770                                                                                | 1578                                                                                |
| Q Serve(g_s), s               | 3.5                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 16.8                                                                              | 5.1                                                                               | 5.1                                                                               | 0.0                                                                                 | 15.0                                                                                | 0.9                                                                                 |
| Cycle Q Clear(g_c), s         | 4.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 16.8                                                                              | 5.1                                                                               | 5.1                                                                               | 0.0                                                                                 | 15.0                                                                                | 0.9                                                                                 |
| Prop In Lane                  | 0.87                                                                              |                                                                                   | 1.00                                                                              | 0.92                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                              |                                                                                   | 0.01                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 229                                                                               | 0                                                                                 | 120                                                                               | 247                                                                               | 0                                                                                 | 0                                                                                 | 504                                                                               | 1357                                                                              | 1425                                                                              | 3                                                                                   | 1506                                                                                | 671                                                                                 |
| V/C Ratio(X)                  | 0.38                                                                              | 0.00                                                                              | 0.00                                                                              | 0.05                                                                              | 0.00                                                                              | 0.00                                                                              | 0.89                                                                              | 0.31                                                                              | 0.31                                                                              | 0.00                                                                                | 0.64                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h         | 742                                                                               | 0                                                                                 | 679                                                                               | 685                                                                               | 0                                                                                 | 0                                                                                 | 1801                                                                              | 1442                                                                              | 1515                                                                              | 1801                                                                                | 2884                                                                                | 1286                                                                                |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 31.2                                                                              | 0.0                                                                               | 0.0                                                                               | 29.6                                                                              | 0.0                                                                               | 0.0                                                                               | 24.0                                                                              | 2.5                                                                               | 2.5                                                                               | 0.0                                                                                 | 15.8                                                                                | 11.8                                                                                |
| Incr Delay (d2), s/veh        | 1.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 2.1                                                                               | 0.3                                                                               | 0.3                                                                               | 0.0                                                                                 | 1.0                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 1.7                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 8.5                                                                               | 2.6                                                                               | 2.7                                                                               | 0.0                                                                                 | 7.4                                                                                 | 0.4                                                                                 |
| LnGrp Delay(d),s/veh          | 32.2                                                                              | 0.0                                                                               | 0.0                                                                               | 29.7                                                                              | 0.0                                                                               | 0.0                                                                               | 26.1                                                                              | 2.8                                                                               | 2.8                                                                               | 0.0                                                                                 | 16.8                                                                                | 11.8                                                                                |
| LnGrp LOS                     | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 | A                                                                                 | A                                                                                 |                                                                                     | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h           |                                                                                   | 87                                                                                |                                                                                   |                                                                                   | 12                                                                                |                                                                                   |                                                                                   | 1315                                                                              |                                                                                   |                                                                                     | 995                                                                                 |                                                                                     |
| Approach Delay, s/veh         |                                                                                   | 32.2                                                                              |                                                                                   |                                                                                   | 29.7                                                                              |                                                                                   |                                                                                   | 10.7                                                                              |                                                                                   |                                                                                     | 16.7                                                                                |                                                                                     |
| Approach LOS                  |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 33.9                                                                              | 35.8                                                                              |                                                                                   | 10.3                                                                              | 0.0                                                                               | 59.6                                                                              |                                                                                   | 10.3                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 71.0                                                                              | 57.0                                                                              |                                                                                   | 27.0                                                                              | 71.0                                                                              | 57.0                                                                              |                                                                                   | 30.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.0), s | 17.0                                                                              | 17.0                                                                              |                                                                                   | 2.4                                                                               | 0.0                                                                               | 7.1                                                                               |                                                                                   | 6.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 1.0                                                                               | 12.8                                                                              |                                                                                   | 0.0                                                                               | 0.0                                                                               | 10.1                                                                              |                                                                                   | 0.3                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           | 14.0                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 5: Honoapiilani Highway & Halawai Drive

10/05/2017

|                              |  |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
|------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                                | EBT                                                                               | EBR                                                                               | WBL  | WBT                                                                               | WBR  | NBL                                                                               | NBT                                                                               | NBR  | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                    |  |  |      |  |      |  |  |      |  |  |  |
| Traffic Volume (veh/h)       | 65                                                                                 | 5                                                                                 | 145                                                                               | 15   | 5                                                                                 | 15   | 105                                                                               | 1140                                                                              | 20   | 10                                                                                  | 1440                                                                                | 70                                                                                  |
| Future Volume (veh/h)        | 65                                                                                 | 5                                                                                 | 145                                                                               | 15   | 5                                                                                 | 15   | 105                                                                               | 1140                                                                              | 20   | 10                                                                                  | 1440                                                                                | 70                                                                                  |
| Number                       | 3                                                                                  | 8                                                                                 | 18                                                                                | 7    | 4                                                                                 | 14   | 1                                                                                 | 6                                                                                 | 16   | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                  | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                               |                                                                                   | 0.98                                                                              | 0.98 |                                                                                   | 0.98 | 1.00                                                                              |                                                                                   | 1.00 | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                               | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 71                                                                                 | 5                                                                                 | 6                                                                                 | 16   | 5                                                                                 | 1    | 114                                                                               | 1239                                                                              | 21   | 11                                                                                  | 1565                                                                                | 47                                                                                  |
| Adj No. of Lanes             | 0                                                                                  | 1                                                                                 | 1                                                                                 | 0    | 1                                                                                 | 0    | 1                                                                                 | 2                                                                                 | 0    | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                               | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                  | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 217                                                                                | 12                                                                                | 143                                                                               | 137  | 33                                                                                | 4    | 145                                                                               | 2588                                                                              | 44   | 14                                                                                  | 2311                                                                                | 1031                                                                                |
| Arrive On Green              | 0.10                                                                               | 0.09                                                                              | 0.09                                                                              | 0.10 | 0.09                                                                              | 0.09 | 0.08                                                                              | 0.73                                                                              | 0.73 | 0.01                                                                                | 0.65                                                                                | 0.65                                                                                |
| Sat Flow, veh/h              | 1419                                                                               | 131                                                                               | 1547                                                                              | 657  | 360                                                                               | 48   | 1774                                                                              | 3561                                                                              | 60   | 1774                                                                                | 3539                                                                                | 1580                                                                                |
| Grp Volume(v), veh/h         | 76                                                                                 | 0                                                                                 | 6                                                                                 | 22   | 0                                                                                 | 0    | 114                                                                               | 615                                                                               | 645  | 11                                                                                  | 1565                                                                                | 47                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1550                                                                               | 0                                                                                 | 1547                                                                              | 1065 | 0                                                                                 | 0    | 1774                                                                              | 1770                                                                              | 1852 | 1774                                                                                | 1770                                                                                | 1580                                                                                |
| Q Serve(g_s), s              | 0.0                                                                                | 0.0                                                                               | 0.3                                                                               | 0.2  | 0.0                                                                               | 0.0  | 5.1                                                                               | 11.8                                                                              | 11.8 | 0.5                                                                                 | 22.3                                                                                | 0.9                                                                                 |
| Cycle Q Clear(g_c), s        | 3.3                                                                                | 0.0                                                                               | 0.3                                                                               | 3.5  | 0.0                                                                               | 0.0  | 5.1                                                                               | 11.8                                                                              | 11.8 | 0.5                                                                                 | 22.3                                                                                | 0.9                                                                                 |
| Prop In Lane                 | 0.93                                                                               |                                                                                   | 1.00                                                                              | 0.73 |                                                                                   | 0.05 | 1.00                                                                              |                                                                                   | 0.03 | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 248                                                                                | 0                                                                                 | 143                                                                               | 188  | 0                                                                                 | 0    | 145                                                                               | 1286                                                                              | 1346 | 14                                                                                  | 2311                                                                                | 1031                                                                                |
| V/C Ratio(X)                 | 0.31                                                                               | 0.00                                                                              | 0.04                                                                              | 0.12 | 0.00                                                                              | 0.00 | 0.79                                                                              | 0.48                                                                              | 0.48 | 0.76                                                                                | 0.68                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h        | 517                                                                                | 0                                                                                 | 439                                                                               | 470  | 0                                                                                 | 0    | 460                                                                               | 1878                                                                              | 1965 | 241                                                                                 | 3319                                                                                | 1481                                                                                |
| HCM Platoon Ratio            | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                               | 0.00                                                                              | 1.00                                                                              | 1.00 | 0.00                                                                              | 0.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 34.4                                                                               | 0.0                                                                               | 33.5                                                                              | 33.8 | 0.0                                                                               | 0.0  | 36.5                                                                              | 4.6                                                                               | 4.6  | 40.1                                                                                | 8.7                                                                                 | 5.0                                                                                 |
| Incr Delay (d2), s/veh       | 0.3                                                                                | 0.0                                                                               | 0.0                                                                               | 0.1  | 0.0                                                                               | 0.0  | 3.5                                                                               | 0.6                                                                               | 0.6  | 26.0                                                                                | 0.8                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                                | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.6                                                                                | 0.0                                                                               | 0.1                                                                               | 0.5  | 0.0                                                                               | 0.0  | 2.6                                                                               | 5.9                                                                               | 6.1  | 0.3                                                                                 | 10.9                                                                                | 0.4                                                                                 |
| LnGrp Delay(d),s/veh         | 34.7                                                                               | 0.0                                                                               | 33.5                                                                              | 33.9 | 0.0                                                                               | 0.0  | 40.0                                                                              | 5.2                                                                               | 5.2  | 66.1                                                                                | 9.5                                                                                 | 5.1                                                                                 |
| LnGrp LOS                    | C                                                                                  |                                                                                   | C                                                                                 | C    |                                                                                   |      | D                                                                                 | A                                                                                 | A    | E                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 82                                                                                 |                                                                                   |                                                                                   | 22   |                                                                                   |      | 1374                                                                              |                                                                                   |      | 1623                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 34.6                                                                               |                                                                                   |                                                                                   | 33.9 |                                                                                   |      | 8.1                                                                               |                                                                                   |      | 9.8                                                                                 |                                                                                     |                                                                                     |
| Approach LOS                 | C                                                                                  |                                                                                   |                                                                                   | C    |                                                                                   |      | A                                                                                 |                                                                                   |      | A                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                  | 2                                                                                 | 3                                                                                 | 4    | 5                                                                                 | 6    | 7                                                                                 | 8                                                                                 |      |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                  | 2                                                                                 |                                                                                   | 4    | 5                                                                                 | 6    |                                                                                   | 8                                                                                 |      |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 10.6                                                                               | 57.9                                                                              |                                                                                   | 12.5 | 4.7                                                                               | 63.9 |                                                                                   | 12.5                                                                              |      |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                                | 5.0                                                                               |                                                                                   | 5.0  | 4.0                                                                               | 5.0  |                                                                                   | 5.0                                                                               |      |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 21.0                                                                               | 76.0                                                                              |                                                                                   | 23.0 | 11.0                                                                              | 86.0 |                                                                                   | 23.0                                                                              |      |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+17, s) | 17.1                                                                               | 24.3                                                                              |                                                                                   | 5.5  | 2.5                                                                               | 13.8 |                                                                                   | 5.3                                                                               |      |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.1                                                                                | 28.6                                                                              |                                                                                   | 0.0  | 0.0                                                                               | 19.9 |                                                                                   | 0.1                                                                               |      |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                    |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                    |                                                                                   | 9.9                                                                               |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                    |                                                                                   | A                                                                                 |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 6: Honoapiilani Highway & Kai Ala Drive/Puukolii Road

10/05/2017

|                             |                                                                                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-----------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                             |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Movement                    | EBL                                                                                | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR  | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations         |                                                                                    |  |  |  |  |      |  |  |  |  |  |  |
| Traffic Volume (veh/h)      | 70                                                                                 | 5                                                                                 | 180                                                                               | 45                                                                                | 5                                                                                 | 40   | 110                                                                               | 1200                                                                              | 50                                                                                | 35                                                                                  | 1510                                                                                | 80                                                                                  |
| Future Volume (veh/h)       | 70                                                                                 | 5                                                                                 | 180                                                                               | 45                                                                                | 5                                                                                 | 40   | 110                                                                               | 1200                                                                              | 50                                                                                | 35                                                                                  | 1510                                                                                | 80                                                                                  |
| Number                      | 3                                                                                  | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14   | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh         | 0                                                                                  | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)         | 1.00                                                                               |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00 | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj            | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln      | 1900                                                                               | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h        | 76                                                                                 | 5                                                                                 | 12                                                                                | 49                                                                                | 5                                                                                 | 3    | 120                                                                               | 1304                                                                              | 34                                                                                | 38                                                                                  | 1641                                                                                | 49                                                                                  |
| Adj No. of Lanes            | 0                                                                                  | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0    | 1                                                                                 | 2                                                                                 | 1                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor            | 0.92                                                                               | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %        | 2                                                                                  | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                  | 263                                                                                | 15                                                                                | 222                                                                               | 204                                                                               | 154                                                                               | 92   | 153                                                                               | 2309                                                                              | 1033                                                                              | 61                                                                                  | 2126                                                                                | 951                                                                                 |
| Arrive On Green             | 0.15                                                                               | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14 | 0.09                                                                              | 0.65                                                                              | 0.65                                                                              | 0.03                                                                                | 0.60                                                                                | 0.60                                                                                |
| Sat Flow, veh/h             | 1296                                                                               | 104                                                                               | 1577                                                                              | 1386                                                                              | 1090                                                                              | 654  | 1774                                                                              | 3539                                                                              | 1583                                                                              | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h        | 81                                                                                 | 0                                                                                 | 12                                                                                | 49                                                                                | 0                                                                                 | 8    | 120                                                                               | 1304                                                                              | 34                                                                                | 38                                                                                  | 1641                                                                                | 49                                                                                  |
| Grp Sat Flow(s),veh/h/ln    | 1400                                                                               | 0                                                                                 | 1577                                                                              | 1386                                                                              | 0                                                                                 | 1744 | 1774                                                                              | 1770                                                                              | 1583                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s             | 4.3                                                                                | 0.0                                                                               | 0.6                                                                               | 2.9                                                                               | 0.0                                                                               | 0.3  | 5.8                                                                               | 17.7                                                                              | 0.7                                                                               | 1.8                                                                                 | 30.1                                                                                | 1.1                                                                                 |
| Cycle Q Clear(g_c), s       | 4.7                                                                                | 0.0                                                                               | 0.6                                                                               | 7.6                                                                               | 0.0                                                                               | 0.3  | 5.8                                                                               | 17.7                                                                              | 0.7                                                                               | 1.8                                                                                 | 30.1                                                                                | 1.1                                                                                 |
| Prop In Lane                | 0.94                                                                               |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.38 | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h      | 293                                                                                | 0                                                                                 | 222                                                                               | 204                                                                               | 0                                                                                 | 246  | 153                                                                               | 2309                                                                              | 1033                                                                              | 61                                                                                  | 2126                                                                                | 951                                                                                 |
| V/C Ratio(X)                | 0.28                                                                               | 0.00                                                                              | 0.05                                                                              | 0.24                                                                              | 0.00                                                                              | 0.03 | 0.79                                                                              | 0.56                                                                              | 0.03                                                                              | 0.62                                                                                | 0.77                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h       | 484                                                                                | 0                                                                                 | 434                                                                               | 390                                                                               | 0                                                                                 | 481  | 428                                                                               | 2803                                                                              | 1254                                                                              | 244                                                                                 | 2438                                                                                | 1091                                                                                |
| HCM Platoon Ratio           | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)          | 1.00                                                                               | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh    | 33.8                                                                               | 0.0                                                                               | 32.4                                                                              | 37.6                                                                              | 0.0                                                                               | 32.3 | 39.0                                                                              | 8.3                                                                               | 5.4                                                                               | 41.5                                                                                | 12.9                                                                                | 7.2                                                                                 |
| Incr Delay (d2), s/veh      | 0.5                                                                                | 0.0                                                                               | 0.1                                                                               | 0.6                                                                               | 0.0                                                                               | 0.1  | 3.3                                                                               | 0.5                                                                               | 0.0                                                                               | 3.8                                                                                 | 1.8                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh   | 0.0                                                                                | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln    | 1.8                                                                                | 0.0                                                                               | 0.3                                                                               | 1.2                                                                               | 0.0                                                                               | 0.2  | 3.0                                                                               | 8.7                                                                               | 0.3                                                                               | 1.0                                                                                 | 15.1                                                                                | 0.5                                                                                 |
| LnGrp Delay(d),s/veh        | 34.3                                                                               | 0.0                                                                               | 32.5                                                                              | 38.2                                                                              | 0.0                                                                               | 32.3 | 42.3                                                                              | 8.8                                                                               | 5.4                                                                               | 45.3                                                                                | 14.8                                                                                | 7.2                                                                                 |
| LnGrp LOS                   | C                                                                                  |                                                                                   | C                                                                                 | D                                                                                 |                                                                                   | C    | D                                                                                 | A                                                                                 | A                                                                                 | D                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h         | 93                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 57   |                                                                                   | 1458                                                                              |                                                                                   | 1728                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh       | 34.1                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 37.4 |                                                                                   | 11.5                                                                              |                                                                                   | 15.2                                                                                |                                                                                     |                                                                                     |
| Approach LOS                | C                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   | D    |                                                                                   | B                                                                                 |                                                                                   | B                                                                                   |                                                                                     |                                                                                     |
| Timer                       | 1                                                                                  | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6    | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                | 1                                                                                  | 2                                                                                 | 4                                                                                 |                                                                                   | 5                                                                                 | 6    | 8                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s    | 11.5                                                                               | 58.3                                                                              | 17.3                                                                              |                                                                                   | 7.0                                                                               | 62.8 | 17.3                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s     | 4.0                                                                                | 6.0                                                                               | 5.0                                                                               |                                                                                   | 4.0                                                                               | 6.0  | 5.0                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s | 21.0                                                                               | 60.0                                                                              | 24.0                                                                              |                                                                                   | 12.0                                                                              | 69.0 | 24.0                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1), s | 17.8                                                                               | 32.1                                                                              | 9.6                                                                               |                                                                                   | 3.8                                                                               | 19.7 | 6.7                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s     | 0.2                                                                                | 20.3                                                                              | 0.1                                                                               |                                                                                   | 0.0                                                                               | 21.2 | 0.2                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary        |                                                                                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay         |                                                                                    |                                                                                   | 14.5                                                                              |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                |                                                                                    |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 7: Honoapiilani Highway & Kaanapali Parkway/Halelo Street

10/05/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)        | 270                                                                               | 5                                                                                 | 445                                                                               | 15                                                                                | 5                                                                                 | 20                                                                                | 290                                                                               | 1290                                                                              | 15                                                                                | 60                                                                                  | 1485                                                                                | 165                                                                                 |
| Future Volume (veh/h)         | 270                                                                               | 5                                                                                 | 445                                                                               | 15                                                                                | 5                                                                                 | 20                                                                                | 290                                                                               | 1290                                                                              | 15                                                                                | 60                                                                                  | 1485                                                                                | 165                                                                                 |
| Number                        | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 297                                                                               | 0                                                                                 | 269                                                                               | 16                                                                                | 5                                                                                 | 7                                                                                 | 315                                                                               | 1402                                                                              | 16                                                                                | 65                                                                                  | 1614                                                                                | 149                                                                                 |
| Adj No. of Lanes              | 2                                                                                 | 0                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 2                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 459                                                                               | 0                                                                                 | 779                                                                               | 46                                                                                | 14                                                                                | 20                                                                                | 428                                                                               | 2294                                                                              | 26                                                                                | 116                                                                                 | 2058                                                                                | 1113                                                                                |
| Arrive On Green               | 0.13                                                                              | 0.00                                                                              | 0.12                                                                              | 0.05                                                                              | 0.05                                                                              | 0.02                                                                              | 0.12                                                                              | 0.64                                                                              | 0.63                                                                              | 0.07                                                                                | 0.58                                                                                | 0.58                                                                                |
| Sat Flow, veh/h               | 3548                                                                              | 0                                                                                 | 3167                                                                              | 992                                                                               | 310                                                                               | 434                                                                               | 3442                                                                              | 3584                                                                              | 41                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h          | 297                                                                               | 0                                                                                 | 269                                                                               | 28                                                                                | 0                                                                                 | 0                                                                                 | 315                                                                               | 692                                                                               | 726                                                                               | 65                                                                                  | 1614                                                                                | 149                                                                                 |
| Grp Sat Flow(s),veh/h/ln      | 1774                                                                              | 0                                                                                 | 1583                                                                              | 1737                                                                              | 0                                                                                 | 0                                                                                 | 1721                                                                              | 1770                                                                              | 1856                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s               | 10.7                                                                              | 0.0                                                                               | 9.4                                                                               | 2.1                                                                               | 0.0                                                                               | 0.0                                                                               | 11.9                                                                              | 31.1                                                                              | 31.2                                                                              | 4.8                                                                                 | 47.3                                                                                | 4.2                                                                                 |
| Cycle Q Clear(g_c), s         | 10.7                                                                              | 0.0                                                                               | 9.4                                                                               | 2.1                                                                               | 0.0                                                                               | 0.0                                                                               | 11.9                                                                              | 31.1                                                                              | 31.2                                                                              | 4.8                                                                                 | 47.3                                                                                | 4.2                                                                                 |
| Prop In Lane                  | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.57                                                                              |                                                                                   | 0.25                                                                              | 1.00                                                                              |                                                                                   | 0.02                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 459                                                                               | 0                                                                                 | 779                                                                               | 80                                                                                | 0                                                                                 | 0                                                                                 | 428                                                                               | 1133                                                                              | 1188                                                                              | 116                                                                                 | 2058                                                                                | 1113                                                                                |
| V/C Ratio(X)                  | 0.65                                                                              | 0.00                                                                              | 0.35                                                                              | 0.35                                                                              | 0.00                                                                              | 0.00                                                                              | 0.74                                                                              | 0.61                                                                              | 0.61                                                                              | 0.56                                                                                | 0.78                                                                                | 0.13                                                                                |
| Avail Cap(c_a), veh/h         | 895                                                                               | 0                                                                                 | 1169                                                                              | 399                                                                               | 0                                                                                 | 0                                                                                 | 1481                                                                              | 2547                                                                              | 2671                                                                              | 197                                                                                 | 3965                                                                                | 1966                                                                                |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 55.8                                                                              | 0.0                                                                               | 41.9                                                                              | 62.7                                                                              | 0.0                                                                               | 0.0                                                                               | 56.9                                                                              | 14.3                                                                              | 14.4                                                                              | 61.1                                                                                | 21.7                                                                                | 6.6                                                                                 |
| Incr Delay (d2), s/veh        | 0.6                                                                               | 0.0                                                                               | 0.1                                                                               | 1.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.9                                                                               | 0.8                                                                               | 0.7                                                                               | 1.6                                                                                 | 1.0                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 5.3                                                                               | 0.0                                                                               | 4.1                                                                               | 1.0                                                                               | 0.0                                                                               | 0.0                                                                               | 5.7                                                                               | 15.4                                                                              | 16.2                                                                              | 2.4                                                                                 | 23.4                                                                                | 2.6                                                                                 |
| LnGrp Delay(d),s/veh          | 56.3                                                                              | 0.0                                                                               | 42.0                                                                              | 63.6                                                                              | 0.0                                                                               | 0.0                                                                               | 57.8                                                                              | 15.1                                                                              | 15.1                                                                              | 62.7                                                                                | 22.7                                                                                | 6.6                                                                                 |
| LnGrp LOS                     | E                                                                                 |                                                                                   | D                                                                                 | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 | B                                                                                 | B                                                                                 | E                                                                                   | C                                                                                   | A                                                                                   |
| Approach Vol, veh/h           | 566                                                                               |                                                                                   | 28                                                                                |                                                                                   |                                                                                   |                                                                                   | 1733                                                                              |                                                                                   |                                                                                   | 1828                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 49.5                                                                              |                                                                                   | 63.6                                                                              |                                                                                   |                                                                                   |                                                                                   | 22.9                                                                              |                                                                                   |                                                                                   | 22.8                                                                                |                                                                                     |                                                                                     |
| Approach LOS                  | D                                                                                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                   |                                                                                     |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 20.7                                                                              | 82.4                                                                              |                                                                                   | 10.2                                                                              | 12.8                                                                              | 90.3                                                                              |                                                                                   | 21.4                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 6.0                                                                               | 6.0                                                                               |                                                                                   | 7.0                                                                               | 6.0                                                                               | 6.0                                                                               |                                                                                   | 7.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 50.0                                                                              | 149.0                                                                             |                                                                                   | 28.0                                                                              | 13.0                                                                              | 192.0                                                                             |                                                                                   | 31.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.3), s | 11.9                                                                              | 49.3                                                                              |                                                                                   | 4.1                                                                               | 6.8                                                                               | 33.2                                                                              |                                                                                   | 12.7                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.9                                                                               | 27.1                                                                              |                                                                                   | 0.0                                                                               | 0.0                                                                               | 15.9                                                                              |                                                                                   | 1.7                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           |                                                                                   |                                                                                   | 26.7                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 8: Honoapiilani Highway & Leialii Parkway

10/05/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |
| Traffic Volume (veh/h)        | 5                                                                                 | 0                                                                                 | 5                                                                                 | 135                                                                               | 5                                                                                 | 65                                                                                | 5                                                                                 | 1460                                                                              | 90                                                                                | 95                                                                                  | 1910                                                                                | 10                                                                                  |
| Future Volume (veh/h)         | 5                                                                                 | 0                                                                                 | 5                                                                                 | 135                                                                               | 5                                                                                 | 65                                                                                | 5                                                                                 | 1460                                                                              | 90                                                                                | 95                                                                                  | 1910                                                                                | 10                                                                                  |
| Number                        | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h          | 5                                                                                 | 0                                                                                 | 1                                                                                 | 147                                                                               | 5                                                                                 | 5                                                                                 | 5                                                                                 | 1587                                                                              | 95                                                                                | 103                                                                                 | 2076                                                                                | 11                                                                                  |
| Adj No. of Lanes              | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 194                                                                               | 5                                                                                 | 30                                                                                | 234                                                                               | 107                                                                               | 107                                                                               | 11                                                                                | 2409                                                                              | 143                                                                               | 129                                                                                 | 2801                                                                                | 15                                                                                  |
| Arrive On Green               | 0.13                                                                              | 0.00                                                                              | 0.12                                                                              | 0.13                                                                              | 0.13                                                                              | 0.12                                                                              | 0.01                                                                              | 0.94                                                                              | 0.93                                                                              | 0.07                                                                                | 0.78                                                                                | 0.77                                                                                |
| Sat Flow, veh/h               | 1140                                                                              | 37                                                                                | 235                                                                               | 1410                                                                              | 856                                                                               | 856                                                                               | 1774                                                                              | 3395                                                                              | 202                                                                               | 1774                                                                                | 3610                                                                                | 19                                                                                  |
| Grp Volume(v), veh/h          | 6                                                                                 | 0                                                                                 | 0                                                                                 | 147                                                                               | 0                                                                                 | 10                                                                                | 5                                                                                 | 823                                                                               | 859                                                                               | 103                                                                                 | 1017                                                                                | 1070                                                                                |
| Grp Sat Flow(s),veh/h/ln      | 1412                                                                              | 0                                                                                 | 0                                                                                 | 1410                                                                              | 0                                                                                 | 1712                                                                              | 1774                                                                              | 1770                                                                              | 1827                                                                              | 1774                                                                                | 1770                                                                                | 1859                                                                                |
| Q Serve(g_s), s               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 12.4                                                                              | 0.0                                                                               | 0.7                                                                               | 0.4                                                                               | 8.9                                                                               | 9.3                                                                               | 7.4                                                                                 | 39.3                                                                                | 39.5                                                                                |
| Cycle Q Clear(g_c), s         | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 13.0                                                                              | 0.0                                                                               | 0.7                                                                               | 0.4                                                                               | 8.9                                                                               | 9.3                                                                               | 7.4                                                                                 | 39.3                                                                                | 39.5                                                                                |
| Prop In Lane                  | 0.83                                                                              |                                                                                   | 0.17                                                                              | 1.00                                                                              |                                                                                   | 0.50                                                                              | 1.00                                                                              |                                                                                   | 0.11                                                                              | 1.00                                                                                |                                                                                     | 0.01                                                                                |
| Lane Grp Cap(c), veh/h        | 228                                                                               | 0                                                                                 | 0                                                                                 | 234                                                                               | 0                                                                                 | 215                                                                               | 11                                                                                | 1256                                                                              | 1296                                                                              | 129                                                                                 | 1373                                                                                | 1443                                                                                |
| V/C Ratio(X)                  | 0.03                                                                              | 0.00                                                                              | 0.00                                                                              | 0.63                                                                              | 0.00                                                                              | 0.05                                                                              | 0.44                                                                              | 0.66                                                                              | 0.66                                                                              | 0.80                                                                                | 0.74                                                                                | 0.74                                                                                |
| Avail Cap(c_a), veh/h         | 312                                                                               | 0                                                                                 | 0                                                                                 | 318                                                                               | 0                                                                                 | 316                                                                               | 150                                                                               | 1256                                                                              | 1296                                                                              | 150                                                                                 | 1373                                                                                | 1443                                                                                |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.33                                                                              | 1.33                                                                              | 1.33                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.78                                                                              | 0.78                                                                              | 0.78                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 50.0                                                                              | 0.0                                                                               | 0.0                                                                               | 55.3                                                                              | 0.0                                                                               | 50.2                                                                              | 64.2                                                                              | 1.3                                                                               | 1.4                                                                               | 59.3                                                                                | 7.7                                                                                 | 7.7                                                                                 |
| Incr Delay (d2), s/veh        | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 2.8                                                                               | 0.0                                                                               | 0.1                                                                               | 7.7                                                                               | 2.1                                                                               | 2.1                                                                               | 19.3                                                                                | 3.6                                                                                 | 3.5                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 5.3                                                                               | 0.0                                                                               | 0.3                                                                               | 0.2                                                                               | 4.6                                                                               | 4.8                                                                               | 4.3                                                                                 | 20.3                                                                                | 21.3                                                                                |
| LnGrp Delay(d),s/veh          | 50.0                                                                              | 0.0                                                                               | 0.0                                                                               | 58.1                                                                              | 0.0                                                                               | 50.3                                                                              | 71.9                                                                              | 3.4                                                                               | 3.4                                                                               | 78.6                                                                                | 11.3                                                                                | 11.2                                                                                |
| LnGrp LOS                     | D                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   | D                                                                                 | E                                                                                 | A                                                                                 | A                                                                                 | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h           | 6                                                                                 |                                                                                   |                                                                                   |                                                                                   | 157                                                                               |                                                                                   | 1687                                                                              |                                                                                   |                                                                                   |                                                                                     | 2190                                                                                |                                                                                     |
| Approach Delay, s/veh         | 50.0                                                                              |                                                                                   |                                                                                   |                                                                                   | 57.6                                                                              |                                                                                   | 3.6                                                                               |                                                                                   |                                                                                   |                                                                                     | 14.4                                                                                |                                                                                     |
| Approach LOS                  | D                                                                                 |                                                                                   |                                                                                   |                                                                                   | E                                                                                 |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 |                                                                                   |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 4.8                                                                               |                                                                                   |                                                                                   |                                                                                   | 20.3                                                                              | 13.5                                                                              | 96.2                                                                              | 20.3                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 1.0                                                                               | 82.0                                                                              |                                                                                   |                                                                                   | 23.0                                                                              | 11.0                                                                              | 82.0                                                                              | 23.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.0), s | 12.4                                                                              | 41.5                                                                              |                                                                                   |                                                                                   | 15.0                                                                              | 9.4                                                                               | 11.3                                                                              | 2.7                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.0                                                                               | 33.6                                                                              |                                                                                   |                                                                                   | 0.3                                                                               | 0.0                                                                               | 35.6                                                                              | 0.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           |                                                                                   |                                                                                   | 11.6                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 9: Honoapiilani Highway & Front Street/Flemming Road

10/05/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                   |  |                                                                                   |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)        | 145                                                                               | 5                                                                                 | 15                                                                                | 65                                                                                | 5                                                                                 | 15                                                                                | 15                                                                                | 1395                                                                              | 15                                                                                | 10                                                                                  | 1680                                                                                | 275                                                                                 |
| Future Volume (veh/h)         | 145                                                                               | 5                                                                                 | 15                                                                                | 65                                                                                | 5                                                                                 | 15                                                                                | 15                                                                                | 1395                                                                              | 15                                                                                | 10                                                                                  | 1680                                                                                | 275                                                                                 |
| Number                        | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 158                                                                               | 5                                                                                 | 14                                                                                | 71                                                                                | 5                                                                                 | 9                                                                                 | 16                                                                                | 1516                                                                              | 15                                                                                | 11                                                                                  | 1826                                                                                | 222                                                                                 |
| Adj No. of Lanes              | 0                                                                                 | 1                                                                                 | 0                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 239                                                                               | 6                                                                                 | 17                                                                                | 238                                                                               | 18                                                                                | 24                                                                                | 19                                                                                | 2730                                                                              | 27                                                                                | 13                                                                                  | 2680                                                                                | 1198                                                                                |
| Arrive On Green               | 0.14                                                                              | 0.14                                                                              | 0.13                                                                              | 0.14                                                                              | 0.14                                                                              | 0.13                                                                              | 0.01                                                                              | 0.76                                                                              | 0.75                                                                              | 0.01                                                                                | 0.76                                                                                | 0.76                                                                                |
| Sat Flow, veh/h               | 1336                                                                              | 42                                                                                | 118                                                                               | 1342                                                                              | 130                                                                               | 174                                                                               | 1774                                                                              | 3591                                                                              | 36                                                                                | 1774                                                                                | 3539                                                                                | 1582                                                                                |
| Grp Volume(v), veh/h          | 177                                                                               | 0                                                                                 | 0                                                                                 | 85                                                                                | 0                                                                                 | 0                                                                                 | 16                                                                                | 747                                                                               | 784                                                                               | 11                                                                                  | 1826                                                                                | 222                                                                                 |
| Grp Sat Flow(s),veh/h/ln      | 1497                                                                              | 0                                                                                 | 0                                                                                 | 1647                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                              | 1770                                                                              | 1856                                                                              | 1774                                                                                | 1770                                                                                | 1582                                                                                |
| Q Serve(g_s), s               | 8.9                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 1.2                                                                               | 22.7                                                                              | 22.8                                                                              | 0.8                                                                                 | 33.6                                                                                | 5.2                                                                                 |
| Cycle Q Clear(g_c), s         | 14.8                                                                              | 0.0                                                                               | 0.0                                                                               | 5.9                                                                               | 0.0                                                                               | 0.0                                                                               | 1.2                                                                               | 22.7                                                                              | 22.8                                                                              | 0.8                                                                                 | 33.6                                                                                | 5.2                                                                                 |
| Prop In Lane                  | 0.89                                                                              |                                                                                   | 0.08                                                                              | 0.84                                                                              |                                                                                   | 0.11                                                                              | 1.00                                                                              |                                                                                   | 0.02                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 262                                                                               | 0                                                                                 | 0                                                                                 | 281                                                                               | 0                                                                                 | 0                                                                                 | 19                                                                                | 1345                                                                              | 1412                                                                              | 13                                                                                  | 2680                                                                                | 1198                                                                                |
| V/C Ratio(X)                  | 0.68                                                                              | 0.00                                                                              | 0.00                                                                              | 0.30                                                                              | 0.00                                                                              | 0.00                                                                              | 0.84                                                                              | 0.55                                                                              | 0.56                                                                              | 0.82                                                                                | 0.68                                                                                | 0.19                                                                                |
| Avail Cap(c_a), veh/h         | 347                                                                               | 0                                                                                 | 0                                                                                 | 367                                                                               | 0                                                                                 | 0                                                                                 | 109                                                                               | 1345                                                                              | 1412                                                                              | 109                                                                                 | 2680                                                                                | 1198                                                                                |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.70                                                                              | 0.70                                                                              | 0.70                                                                              | 0.57                                                                                | 0.57                                                                                | 0.57                                                                                |
| Uniform Delay (d), s/veh      | 54.2                                                                              | 0.0                                                                               | 0.0                                                                               | 50.7                                                                              | 0.0                                                                               | 0.0                                                                               | 64.2                                                                              | 6.5                                                                               | 6.5                                                                               | 64.4                                                                                | 7.9                                                                                 | 4.5                                                                                 |
| Incr Delay (d2), s/veh        | 3.3                                                                               | 0.0                                                                               | 0.0                                                                               | 0.6                                                                               | 0.0                                                                               | 0.0                                                                               | 21.7                                                                              | 1.2                                                                               | 1.1                                                                               | 21.8                                                                                | 0.8                                                                                 | 0.2                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 6.4                                                                               | 0.0                                                                               | 0.0                                                                               | 2.8                                                                               | 0.0                                                                               | 0.0                                                                               | 0.7                                                                               | 11.4                                                                              | 12.0                                                                              | 0.5                                                                                 | 16.5                                                                                | 2.3                                                                                 |
| LnGrp Delay(d),s/veh          | 57.5                                                                              | 0.0                                                                               | 0.0                                                                               | 51.3                                                                              | 0.0                                                                               | 0.0                                                                               | 85.9                                                                              | 7.6                                                                               | 7.6                                                                               | 86.3                                                                                | 8.7                                                                                 | 4.7                                                                                 |
| LnGrp LOS                     | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | F                                                                                 | A                                                                                 | A                                                                                 | F                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h           |                                                                                   | 177                                                                               |                                                                                   |                                                                                   | 85                                                                                |                                                                                   |                                                                                   | 1547                                                                              |                                                                                   |                                                                                     | 2059                                                                                |                                                                                     |
| Approach Delay, s/veh         |                                                                                   | 57.5                                                                              |                                                                                   |                                                                                   | 51.3                                                                              |                                                                                   |                                                                                   | 8.4                                                                               |                                                                                   |                                                                                     | 8.7                                                                                 |                                                                                     |
| Approach LOS                  |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 102.4                                                                             |                                                                                   |                                                                                   | 22.2                                                                              | 5.0                                                                               | 102.8                                                                             |                                                                                   | 22.2                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 83.0                                                                              |                                                                                   |                                                                                   | 25.0                                                                              | 8.0                                                                               | 83.0                                                                              |                                                                                   | 25.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.2), s | 35.6                                                                              |                                                                                   |                                                                                   | 7.9                                                                               | 2.8                                                                               | 24.8                                                                              |                                                                                   | 16.8                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.0                                                                               | 40.8                                                                              |                                                                                   | 0.2                                                                               | 0.0                                                                               | 36.3                                                                              |                                                                                   | 0.4                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           |                                                                                   |                                                                                   | 11.8                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 10: Honoapiilani Highway & Kapunakea Street

10/05/2017

|                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                              |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)       | 205                                                                               | 20                                                                                | 50                                                                                | 90                                                                                | 20                                                                                | 20                                                                                | 60                                                                                | 1410                                                                              | 60                                                                                | 15                                                                                  | 1685                                                                                | 140                                                                                 |
| Future Volume (veh/h)        | 205                                                                               | 20                                                                                | 50                                                                                | 90                                                                                | 20                                                                                | 20                                                                                | 60                                                                                | 1410                                                                              | 60                                                                                | 15                                                                                  | 1685                                                                                | 140                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 223                                                                               | 22                                                                                | 12                                                                                | 98                                                                                | 22                                                                                | 4                                                                                 | 65                                                                                | 1533                                                                              | 63                                                                                | 16                                                                                  | 1832                                                                                | 148                                                                                 |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 304                                                                               | 25                                                                                | 327                                                                               | 398                                                                               | 318                                                                               | 58                                                                                | 83                                                                                | 2389                                                                              | 98                                                                                | 19                                                                                  | 2171                                                                                | 173                                                                                 |
| Arrive On Green              | 0.21                                                                              | 0.21                                                                              | 0.21                                                                              | 0.21                                                                              | 0.21                                                                              | 0.20                                                                              | 0.06                                                                              | 0.92                                                                              | 0.91                                                                              | 0.01                                                                                | 0.87                                                                                | 0.86                                                                                |
| Sat Flow, veh/h              | 1209                                                                              | 119                                                                               | 1576                                                                              | 1381                                                                              | 1533                                                                              | 279                                                                               | 1774                                                                              | 3464                                                                              | 142                                                                               | 1774                                                                                | 3321                                                                                | 265                                                                                 |
| Grp Volume(v), veh/h         | 245                                                                               | 0                                                                                 | 12                                                                                | 98                                                                                | 0                                                                                 | 26                                                                                | 65                                                                                | 781                                                                               | 815                                                                               | 16                                                                                  | 965                                                                                 | 1015                                                                                |
| Grp Sat Flow(s),veh/h/ln     | 1328                                                                              | 0                                                                                 | 1576                                                                              | 1381                                                                              | 0                                                                                 | 1812                                                                              | 1774                                                                              | 1770                                                                              | 1837                                                                              | 1774                                                                                | 1770                                                                                | 1816                                                                                |
| Q Serve(g_s), s              | 22.1                                                                              | 0.0                                                                               | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 1.5                                                                               | 4.7                                                                               | 11.5                                                                              | 11.8                                                                              | 1.2                                                                                 | 33.7                                                                                | 37.3                                                                                |
| Cycle Q Clear(g_c), s        | 23.6                                                                              | 0.0                                                                               | 0.8                                                                               | 6.3                                                                               | 0.0                                                                               | 1.5                                                                               | 4.7                                                                               | 11.5                                                                              | 11.8                                                                              | 1.2                                                                                 | 33.7                                                                                | 37.3                                                                                |
| Prop In Lane                 | 0.91                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.15                                                                              | 1.00                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                                |                                                                                     | 0.15                                                                                |
| Lane Grp Cap(c), veh/h       | 328                                                                               | 0                                                                                 | 327                                                                               | 398                                                                               | 0                                                                                 | 376                                                                               | 83                                                                                | 1220                                                                              | 1267                                                                              | 19                                                                                  | 1157                                                                                | 1187                                                                                |
| V/C Ratio(X)                 | 0.75                                                                              | 0.00                                                                              | 0.04                                                                              | 0.25                                                                              | 0.00                                                                              | 0.07                                                                              | 0.79                                                                              | 0.64                                                                              | 0.64                                                                              | 0.84                                                                                | 0.83                                                                                | 0.86                                                                                |
| Avail Cap(c_a), veh/h        | 372                                                                               | 0                                                                                 | 376                                                                               | 441                                                                               | 0                                                                                 | 432                                                                               | 109                                                                               | 1220                                                                              | 1267                                                                              | 109                                                                                 | 1157                                                                                | 1187                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.33                                                                              | 1.33                                                                              | 1.33                                                                              | 1.33                                                                                | 1.33                                                                                | 1.33                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.55                                                                              | 0.55                                                                              | 0.55                                                                              | 0.65                                                                                | 0.65                                                                                | 0.65                                                                                |
| Uniform Delay (d), s/veh     | 50.9                                                                              | 0.0                                                                               | 41.1                                                                              | 43.3                                                                              | 0.0                                                                               | 41.5                                                                              | 60.3                                                                              | 2.1                                                                               | 2.2                                                                               | 64.0                                                                                | 5.1                                                                                 | 5.4                                                                                 |
| Incr Delay (d2), s/veh       | 7.1                                                                               | 0.0                                                                               | 0.0                                                                               | 0.3                                                                               | 0.0                                                                               | 0.1                                                                               | 10.1                                                                              | 1.4                                                                               | 1.4                                                                               | 20.3                                                                                | 4.7                                                                                 | 5.4                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.2                                                                               | 0.0                                                                               | 0.3                                                                               | 3.0                                                                               | 0.0                                                                               | 0.8                                                                               | 2.5                                                                               | 5.6                                                                               | 5.8                                                                               | 0.7                                                                                 | 17.1                                                                                | 19.3                                                                                |
| LnGrp Delay(d),s/veh         | 58.0                                                                              | 0.0                                                                               | 41.2                                                                              | 43.7                                                                              | 0.0                                                                               | 41.6                                                                              | 70.4                                                                              | 3.6                                                                               | 3.6                                                                               | 84.3                                                                                | 9.9                                                                                 | 10.8                                                                                |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 |                                                                                   | D                                                                                 | E                                                                                 | A                                                                                 | A                                                                                 | F                                                                                   | A                                                                                   | B                                                                                   |
| Approach Vol, veh/h          | 257                                                                               |                                                                                   |                                                                                   |                                                                                   | 124                                                                               |                                                                                   | 1661                                                                              |                                                                                   |                                                                                   |                                                                                     | 1996                                                                                |                                                                                     |
| Approach Delay, s/veh        | 57.2                                                                              |                                                                                   |                                                                                   |                                                                                   | 43.2                                                                              |                                                                                   | 6.2                                                                               |                                                                                   |                                                                                   |                                                                                     | 10.9                                                                                |                                                                                     |
| Approach LOS                 | E                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 30.1                                                                              | 89.0                                                                              |                                                                                   |                                                                                   | 31.0                                                                              | 5.4                                                                               | 93.6                                                                              | 31.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 78.0                                                                              | 78.0                                                                              |                                                                                   |                                                                                   | 30.0                                                                              | 8.0                                                                               | 78.0                                                                              | 30.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+10), s | 39.3                                                                              | 39.3                                                                              |                                                                                   |                                                                                   | 8.3                                                                               | 3.2                                                                               | 13.8                                                                              | 25.6                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 30.8                                                                              |                                                                                   |                                                                                   | 0.4                                                                               | 0.0                                                                               | 30.8                                                                              | 0.4                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 12.9                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 11: Honoapiilani Highway & Keawe Street

10/05/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |   |  |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                                | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                   |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)        | 65                                                                                | 150                                                                               | 90                                                                                | 145                                                                               | 130                                                                               | 695                                                                               | 80                                                                                | 765                                                                               | 195                                                                                | 600                                                                                 | 995                                                                                 | 105                                                                                 |
| Future Volume (veh/h)         | 65                                                                                | 150                                                                               | 90                                                                                | 145                                                                               | 130                                                                               | 695                                                                               | 80                                                                                | 765                                                                               | 195                                                                                | 600                                                                                 | 995                                                                                 | 105                                                                                 |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                 | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 0.98                                                                              |                                                                                   | 0.96                                                                              | 1.00                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h          | 71                                                                                | 163                                                                               | 11                                                                                | 158                                                                               | 141                                                                               | 369                                                                               | 87                                                                                | 832                                                                               | 126                                                                                | 652                                                                                 | 1082                                                                                | 109                                                                                 |
| Adj No. of Lanes              | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 2                                                                                 | 1                                                                                  | 2                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 107                                                                               | 192                                                                               | 279                                                                               | 250                                                                               | 574                                                                               | 475                                                                               | 110                                                                               | 1369                                                                              | 604                                                                                | 732                                                                                 | 1746                                                                                | 176                                                                                 |
| Arrive On Green               | 0.18                                                                              | 0.18                                                                              | 0.18                                                                              | 0.09                                                                              | 0.31                                                                              | 0.31                                                                              | 0.06                                                                              | 0.39                                                                              | 0.39                                                                               | 0.14                                                                                | 0.36                                                                                | 0.36                                                                                |
| Sat Flow, veh/h               | 383                                                                               | 1040                                                                              | 1514                                                                              | 1774                                                                              | 1863                                                                              | 1542                                                                              | 1774                                                                              | 3539                                                                              | 1561                                                                               | 3442                                                                                | 3247                                                                                | 327                                                                                 |
| Grp Volume(v), veh/h          | 234                                                                               | 0                                                                                 | 11                                                                                | 158                                                                               | 141                                                                               | 369                                                                               | 87                                                                                | 832                                                                               | 126                                                                                | 652                                                                                 | 589                                                                                 | 602                                                                                 |
| Grp Sat Flow(s),veh/h/ln      | 1423                                                                              | 0                                                                                 | 1514                                                                              | 1774                                                                              | 1863                                                                              | 1542                                                                              | 1774                                                                              | 1770                                                                              | 1561                                                                               | 1721                                                                                | 1770                                                                                | 1805                                                                                |
| Q Serve(g_s), s               | 18.7                                                                              | 0.0                                                                               | 0.8                                                                               | 9.0                                                                               | 7.4                                                                               | 28.3                                                                              | 6.3                                                                               | 24.5                                                                              | 7.0                                                                                | 24.2                                                                                | 35.6                                                                                | 35.7                                                                                |
| Cycle Q Clear(g_c), s         | 20.8                                                                              | 0.0                                                                               | 0.8                                                                               | 9.0                                                                               | 7.4                                                                               | 28.3                                                                              | 6.3                                                                               | 24.5                                                                              | 7.0                                                                                | 24.2                                                                                | 35.6                                                                                | 35.7                                                                                |
| Prop In Lane                  | 0.30                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                               | 1.00                                                                                |                                                                                     | 0.18                                                                                |
| Lane Grp Cap(c), veh/h        | 299                                                                               | 0                                                                                 | 279                                                                               | 250                                                                               | 574                                                                               | 475                                                                               | 110                                                                               | 1369                                                                              | 604                                                                                | 732                                                                                 | 952                                                                                 | 970                                                                                 |
| V/C Ratio(X)                  | 0.78                                                                              | 0.00                                                                              | 0.04                                                                              | 0.63                                                                              | 0.25                                                                              | 0.78                                                                              | 0.79                                                                              | 0.61                                                                              | 0.21                                                                               | 0.89                                                                                | 0.62                                                                                | 0.62                                                                                |
| Avail Cap(c_a), veh/h         | 320                                                                               | 0                                                                                 | 303                                                                               | 277                                                                               | 630                                                                               | 522                                                                               | 328                                                                               | 1369                                                                              | 604                                                                                | 953                                                                                 | 952                                                                                 | 970                                                                                 |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 0.67                                                                                | 0.67                                                                                | 0.67                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.79                                                                              | 0.79                                                                              | 0.79                                                                               | 0.41                                                                                | 0.41                                                                                | 0.41                                                                                |
| Uniform Delay (d), s/veh      | 51.4                                                                              | 0.0                                                                               | 43.5                                                                              | 38.0                                                                              | 33.7                                                                              | 40.9                                                                              | 60.2                                                                              | 31.9                                                                              | 26.6                                                                               | 54.3                                                                                | 30.6                                                                                | 30.7                                                                                |
| Incr Delay (d2), s/veh        | 11.3                                                                              | 0.0                                                                               | 0.1                                                                               | 4.0                                                                               | 0.2                                                                               | 6.7                                                                               | 3.8                                                                               | 1.6                                                                               | 0.6                                                                                | 3.3                                                                                 | 1.3                                                                                 | 1.2                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 0.1                                                                               | 0.0                                                                               | 0.3                                                                               | 4.6                                                                               | 3.8                                                                               | 12.9                                                                              | 3.2                                                                               | 12.3                                                                              | 3.1                                                                                | 11.9                                                                                | 17.8                                                                                | 18.2                                                                                |
| LnGrp Delay(d),s/veh          | 62.7                                                                              | 0.0                                                                               | 43.6                                                                              | 41.9                                                                              | 33.9                                                                              | 47.6                                                                              | 64.0                                                                              | 33.5                                                                              | 27.2                                                                               | 57.5                                                                                | 31.9                                                                                | 31.9                                                                                |
| LnGrp LOS                     | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 | C                                                                                 | D                                                                                 | E                                                                                 | C                                                                                 | C                                                                                  | E                                                                                   | C                                                                                   | C                                                                                   |
| Approach Vol, veh/h           |                                                                                   | 245                                                                               |                                                                                   |                                                                                   | 668                                                                               |                                                                                   |                                                                                   | 1045                                                                              |                                                                                    |                                                                                     | 1843                                                                                |                                                                                     |
| Approach Delay, s/veh         |                                                                                   | 61.8                                                                              |                                                                                   |                                                                                   | 43.4                                                                              |                                                                                   |                                                                                   | 35.3                                                                              |                                                                                    |                                                                                     | 41.0                                                                                |                                                                                     |
| Approach LOS                  |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                    |                                                                                     | D                                                                                   |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 12.0                                                                              | 73.9                                                                              | 16.1                                                                              | 28.0                                                                              | 31.7                                                                              | 54.3                                                                              |                                                                                   | 44.1                                                                              |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 24.0                                                                              | 49.0                                                                              | 13.0                                                                              | 25.0                                                                              | 36.0                                                                              | 37.0                                                                              |                                                                                   | 43.0                                                                              |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.3), s | 19.3                                                                              | 37.7                                                                              | 11.0                                                                              | 22.8                                                                              | 26.2                                                                              | 26.5                                                                              |                                                                                   | 30.3                                                                              |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.1                                                                               | 7.3                                                                               | 0.1                                                                               | 0.2                                                                               | 1.5                                                                               | 5.9                                                                               |                                                                                   | 2.0                                                                               |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           |                                                                                   |                                                                                   | 41.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Notes                         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |

Intersection

Int Delay, s/veh 0.9

| Movement                 | WBL  | WBR                                                                               | NBT                                                                               | NBR                                                                               | SBL  | SBT                                                                                 |
|--------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|
| Lane Configurations      |      |  |  |  |      |  |
| Traffic Vol, veh/h       | 0    | 95                                                                                | 635                                                                               | 110                                                                               | 0    | 840                                                                                 |
| Future Vol, veh/h        | 0    | 95                                                                                | 635                                                                               | 110                                                                               | 0    | 840                                                                                 |
| Conflicting Peds, #/hr   | 0    | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   |
| Sign Control             | Stop | Stop                                                                              | Free                                                                              | Free                                                                              | Free | Free                                                                                |
| RT Channelized           | -    | None                                                                              | -                                                                                 | None                                                                              | -    | None                                                                                |
| Storage Length           | -    | 0                                                                                 | -                                                                                 | 0                                                                                 | -    | -                                                                                   |
| Veh in Median Storage, # | 0    | -                                                                                 | 0                                                                                 | -                                                                                 | -    | 0                                                                                   |
| Grade, %                 | 0    | -                                                                                 | 0                                                                                 | -                                                                                 | -    | 0                                                                                   |
| Peak Hour Factor         | 92   | 92                                                                                | 92                                                                                | 92                                                                                | 92   | 92                                                                                  |
| Heavy Vehicles, %        | 2    | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                   |
| Mvmt Flow                | 0    | 103                                                                               | 690                                                                               | 120                                                                               | 0    | 913                                                                                 |

| Major/Minor          | Minor1 | Major1 | Major2 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | -      | 690    | 0 0    |
| Stage 1              | -      | -      | - -    |
| Stage 2              | -      | -      | - -    |
| Critical Hdwy        | -      | 6.22   | - -    |
| Critical Hdwy Stg 1  | -      | -      | - -    |
| Critical Hdwy Stg 2  | -      | -      | - -    |
| Follow-up Hdwy       | -      | 3.318  | - -    |
| Pot Cap-1 Maneuver   | 0      | 445    | 0 -    |
| Stage 1              | 0      | -      | 0 -    |
| Stage 2              | 0      | -      | 0 -    |
| Platoon blocked, %   |        |        | - -    |
| Mov Cap-1 Maneuver   | -      | 445    | - -    |
| Mov Cap-2 Maneuver   | -      | -      | - -    |
| Stage 1              | -      | -      | - -    |
| Stage 2              | -      | -      | - -    |

| Approach             | WB   | NB | SB |
|----------------------|------|----|----|
| HCM Control Delay, s | 15.5 | 0  | 0  |
| HCM LOS              | C    |    |    |

| Minor Lane/Major Mvmt | NBT | NBRWBLn1 | SBT |
|-----------------------|-----|----------|-----|
| Capacity (veh/h)      | -   | - 445    | -   |
| HCM Lane V/C Ratio    | -   | - 0.232  | -   |
| HCM Control Delay (s) | -   | - 15.5   | -   |
| HCM Lane LOS          | -   | - C      | -   |
| HCM 95th %tile Q(veh) | -   | - 0.9    | -   |

HCM 2010 TWSC  
14: Road A & Akahele Street

10/05/2017

| Intersection             |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|--------|-------------------------------------------------------------------------------------|-------|--------|-------------------------------------------------------------------------------------|-------|
| Int Delay, s/veh         | 9.7                                                                               |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Movement                 | EBL                                                                               | EBT                                                                               | EBR  | WBL                                                                               | WBT                                                                               | WBR  | NBL    | NBT                                                                                 | NBR   | SBL    | SBT                                                                                 | SBR   |
| Lane Configurations      |  |  |      |  |  |      |        |  |       |        |  |       |
| Traffic Vol, veh/h       | 180                                                                               | 90                                                                                | 120  | 5                                                                                 | 80                                                                                | 5    | 110    | 5                                                                                   | 5     | 5      | 5                                                                                   | 175   |
| Future Vol, veh/h        | 180                                                                               | 90                                                                                | 120  | 5                                                                                 | 80                                                                                | 5    | 110    | 5                                                                                   | 5     | 5      | 5                                                                                   | 175   |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0      | 0                                                                                   | 0     | 0      | 0                                                                                   | 0     |
| Sign Control             | Free                                                                              | Free                                                                              | Free | Free                                                                              | Free                                                                              | Free | Stop   | Stop                                                                                | Stop  | Stop   | Stop                                                                                | Stop  |
| RT Channelized           | -                                                                                 | -                                                                                 | None | -                                                                                 | -                                                                                 | None | -      | -                                                                                   | None  | -      | -                                                                                   | None  |
| Storage Length           | 100                                                                               | -                                                                                 | -    | 100                                                                               | -                                                                                 | -    | -      | -                                                                                   | -     | -      | -                                                                                   | -     |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | -    | -                                                                                 | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Grade, %                 | -                                                                                 | 0                                                                                 | -    | -                                                                                 | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Peak Hour Factor         | 92                                                                                | 92                                                                                | 92   | 92                                                                                | 92                                                                                | 92   | 92     | 92                                                                                  | 92    | 92     | 92                                                                                  | 92    |
| Heavy Vehicles, %        | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    | 2      | 2                                                                                   | 2     | 2      | 2                                                                                   | 2     |
| Mvmt Flow                | 196                                                                               | 98                                                                                | 130  | 5                                                                                 | 87                                                                                | 5    | 120    | 5                                                                                   | 5     | 5      | 5                                                                                   | 190   |
|                          |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Major/Minor              | Major1                                                                            |                                                                                   |      | Major2                                                                            |                                                                                   |      | Minor1 |                                                                                     |       | Minor2 |                                                                                     |       |
| Conflicting Flow All     | 92                                                                                | 0                                                                                 | 0    | 228                                                                               | 0                                                                                 | 0    | 752    | 657                                                                                 | 163   | 660    | 720                                                                                 | 90    |
| Stage 1                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 555    | 555                                                                                 | -     | 100    | 100                                                                                 | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 197    | 102                                                                                 | -     | 560    | 620                                                                                 | -     |
| Critical Hdwy            | 4.12                                                                              | -                                                                                 | -    | 4.12                                                                              | -                                                                                 | -    | 7.12   | 6.52                                                                                | 6.22  | 7.12   | 6.52                                                                                | 6.22  |
| Critical Hdwy Stg 1      | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Critical Hdwy Stg 2      | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Follow-up Hdwy           | 2.218                                                                             | -                                                                                 | -    | 2.218                                                                             | -                                                                                 | -    | 3.518  | 4.018                                                                               | 3.318 | 3.518  | 4.018                                                                               | 3.318 |
| Pot Cap-1 Maneuver       | 1503                                                                              | -                                                                                 | -    | 1340                                                                              | -                                                                                 | -    | 327    | 385                                                                                 | 882   | 376    | 354                                                                                 | 968   |
| Stage 1                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 516    | 513                                                                                 | -     | 906    | 812                                                                                 | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 805    | 811                                                                                 | -     | 513    | 480                                                                                 | -     |
| Platoon blocked, %       |                                                                                   | -                                                                                 | -    |                                                                                   | -                                                                                 | -    |        |                                                                                     |       |        |                                                                                     |       |
| Mov Cap-1 Maneuver       | 1503                                                                              | -                                                                                 | -    | 1340                                                                              | -                                                                                 | -    | 233    | 334                                                                                 | 882   | 331    | 307                                                                                 | 968   |
| Mov Cap-2 Maneuver       | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 233    | 334                                                                                 | -     | 331    | 307                                                                                 | -     |
| Stage 1                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 449    | 446                                                                                 | -     | 788    | 809                                                                                 | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 640    | 808                                                                                 | -     | 438    | 418                                                                                 | -     |
|                          |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Approach                 | EB                                                                                |                                                                                   |      | WB                                                                                |                                                                                   |      | NB     |                                                                                     |       | SB     |                                                                                     |       |
| HCM Control Delay, s     | 3.6                                                                               |                                                                                   |      | 0.4                                                                               |                                                                                   |      | 35.5   |                                                                                     |       | 10.4   |                                                                                     |       |
| HCM LOS                  |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      | E      |                                                                                     |       | B      |                                                                                     |       |
|                          |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Minor Lane/Major Mvmt    | NBLn1                                                                             | EBL                                                                               | EBT  | EBR                                                                               | WBL                                                                               | WBT  | WBR    | SBLn1                                                                               |       |        |                                                                                     |       |
| Capacity (veh/h)         | 244                                                                               | 1503                                                                              | -    | -                                                                                 | 1340                                                                              | -    | -      | 872                                                                                 |       |        |                                                                                     |       |
| HCM Lane V/C Ratio       | 0.535                                                                             | 0.13                                                                              | -    | -                                                                                 | 0.004                                                                             | -    | -      | 0.231                                                                               |       |        |                                                                                     |       |
| HCM Control Delay (s)    | 35.5                                                                              | 7.8                                                                               | -    | -                                                                                 | 7.7                                                                               | -    | -      | 10.4                                                                                |       |        |                                                                                     |       |
| HCM Lane LOS             | E                                                                                 | A                                                                                 | -    | -                                                                                 | A                                                                                 | -    | -      | B                                                                                   |       |        |                                                                                     |       |
| HCM 95th %tile O(veh)    | 2.9                                                                               | 0.4                                                                               | -    | -                                                                                 | 0                                                                                 | -    | -      | 0.9                                                                                 |       |        |                                                                                     |       |

| Intersection             |        |              |      |        |              |      |        |              |       |        |              |       |
|--------------------------|--------|--------------|------|--------|--------------|------|--------|--------------|-------|--------|--------------|-------|
| Int Delay, s/veh         | 4.6    |              |      |        |              |      |        |              |       |        |              |       |
| Movement                 | EBL    | EBT          | EBR  | WBL    | WBT          | WBR  | NBL    | NBT          | NBR   | SBL    | SBT          | SBR   |
| Lane Configurations      |        | <div>↕</div> |      |        | <div>↕</div> |      |        | <div>↕</div> |       |        | <div>↕</div> |       |
| Traffic Vol, veh/h       | 20     | 20           | 50   | 5      | 25           | 5    | 45     | 5            | 5     | 5      | 5            | 15    |
| Future Vol, veh/h        | 20     | 20           | 50   | 5      | 25           | 5    | 45     | 5            | 5     | 5      | 5            | 15    |
| Conflicting Peds, #/hr   | 0      | 0            | 0    | 0      | 0            | 0    | 0      | 0            | 0     | 0      | 0            | 0     |
| Sign Control             | Free   | Free         | Free | Free   | Free         | Free | Stop   | Stop         | Stop  | Stop   | Stop         | Stop  |
| RT Channelized           | -      | -            | None | -      | -            | None | -      | -            | None  | -      | -            | None  |
| Storage Length           | -      | -            | -    | -      | -            | -    | -      | -            | -     | -      | -            | -     |
| Veh in Median Storage, # | -      | 0            | -    | -      | 0            | -    | -      | 0            | -     | -      | 0            | -     |
| Grade, %                 | -      | 0            | -    | -      | 0            | -    | -      | 0            | -     | -      | 0            | -     |
| Peak Hour Factor         | 92     | 92           | 92   | 92     | 92           | 92   | 92     | 92           | 92    | 92     | 92           | 92    |
| Heavy Vehicles, %        | 2      | 2            | 2    | 2      | 2            | 2    | 2      | 2            | 2     | 2      | 2            | 2     |
| Mvmt Flow                | 22     | 22           | 54   | 5      | 27           | 5    | 49     | 5            | 5     | 5      | 5            | 16    |
|                          |        |              |      |        |              |      |        |              |       |        |              |       |
| Major/Minor              | Major1 |              |      | Major2 |              |      | Minor1 |              |       | Minor2 |              |       |
| Conflicting Flow All     | 32     | 0            | 0    | 76     | 0            | 0    | 143    | 135          | 49    | 138    | 160          | 30    |
| Stage 1                  | -      | -            | -    | -      | -            | -    | 93     | 93           | -     | 40     | 40           | -     |
| Stage 2                  | -      | -            | -    | -      | -            | -    | 50     | 42           | -     | 98     | 120          | -     |
| Critical Hdwy            | 4.12   | -            | -    | 4.12   | -            | -    | 7.12   | 6.52         | 6.22  | 7.12   | 6.52         | 6.22  |
| Critical Hdwy Stg 1      | -      | -            | -    | -      | -            | -    | 6.12   | 5.52         | -     | 6.12   | 5.52         | -     |
| Critical Hdwy Stg 2      | -      | -            | -    | -      | -            | -    | 6.12   | 5.52         | -     | 6.12   | 5.52         | -     |
| Follow-up Hdwy           | 2.218  | -            | -    | 2.218  | -            | -    | 3.518  | 4.018        | 3.318 | 3.518  | 4.018        | 3.318 |
| Pot Cap-1 Maneuver       | 1580   | -            | -    | 1523   | -            | -    | 826    | 756          | 1020  | 833    | 732          | 1044  |
| Stage 1                  | -      | -            | -    | -      | -            | -    | 914    | 818          | -     | 975    | 862          | -     |
| Stage 2                  | -      | -            | -    | -      | -            | -    | 963    | 860          | -     | 908    | 796          | -     |
| Platoon blocked, %       |        | -            | -    |        | -            | -    |        |              |       |        |              |       |
| Mov Cap-1 Maneuver       | 1580   | -            | -    | 1523   | -            | -    | 797    | 742          | 1020  | 813    | 719          | 1044  |
| Mov Cap-2 Maneuver       | -      | -            | -    | -      | -            | -    | 797    | 742          | -     | 813    | 719          | -     |
| Stage 1                  | -      | -            | -    | -      | -            | -    | 900    | 806          | -     | 960    | 859          | -     |
| Stage 2                  | -      | -            | -    | -      | -            | -    | 939    | 857          | -     | 884    | 784          | -     |
|                          |        |              |      |        |              |      |        |              |       |        |              |       |
| Approach                 | EB     |              |      | WB     |              |      | NB     |              |       | SB     |              |       |
| HCM Control Delay, s     | 1.6    |              |      | 1.1    |              |      | 9.8    |              |       | 9.1    |              |       |
| HCM LOS                  |        |              |      |        |              |      | A      |              |       | A      |              |       |
|                          |        |              |      |        |              |      |        |              |       |        |              |       |
| Minor Lane/Major Mvmt    | NBLn1  | EBL          | EBT  | EBR    | WBL          | WBT  | WBR    | SBLn1        |       |        |              |       |
| Capacity (veh/h)         | 808    | 1580         | -    | -      | 1523         | -    | -      | 910          |       |        |              |       |
| HCM Lane V/C Ratio       | 0.074  | 0.014        | -    | -      | 0.004        | -    | -      | 0.03         |       |        |              |       |
| HCM Control Delay (s)    | 9.8    | 7.3          | 0    | -      | 7.4          | 0    | -      | 9.1          |       |        |              |       |
| HCM Lane LOS             | A      | A            | A    | -      | A            | A    | -      | A            |       |        |              |       |
| HCM 95th %tile O(veh)    | 0.2    | 0            | -    | -      | 0            | -    | -      | 0.1          |       |        |              |       |



---

## **APPENDIX C**

### LEVEL OF SERVICE CALCULATIONS

- Future Year 2022 Scenario 3 AM Peak
-

# HCM 2010 Signalized Intersection Summary

## 1: Honoapiilani Highway & Napilihau Street

10/05/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 50                                                                                | 45                                                                                | 310                                                                               | 95                                                                                | 50                                                                                | 20                                                                                | 255                                                                                | 265                                                                                 | 115                                                                                 | 10                                                                                  | 140                                                                                 | 30                                                                                  |
| Future Volume (veh/h)        | 50                                                                                | 45                                                                                | 310                                                                               | 95                                                                                | 50                                                                                | 20                                                                                | 255                                                                                | 265                                                                                 | 115                                                                                 | 10                                                                                  | 140                                                                                 | 30                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                  | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.99                                                                              | 0.99                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 54                                                                                | 49                                                                                | 44                                                                                | 103                                                                               | 54                                                                                | 11                                                                                | 277                                                                                | 288                                                                                 | 60                                                                                  | 11                                                                                  | 152                                                                                 | 8                                                                                   |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 235                                                                               | 169                                                                               | 265                                                                               | 326                                                                               | 254                                                                               | 52                                                                                | 364                                                                                | 814                                                                                 | 692                                                                                 | 15                                                                                  | 448                                                                                 | 381                                                                                 |
| Arrive On Green              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.21                                                                               | 0.44                                                                                | 0.44                                                                                | 0.01                                                                                | 0.24                                                                                | 0.24                                                                                |
| Sat Flow, veh/h              | 611                                                                               | 1001                                                                              | 1569                                                                              | 1289                                                                              | 1500                                                                              | 306                                                                               | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 103                                                                               | 0                                                                                 | 44                                                                                | 103                                                                               | 0                                                                                 | 65                                                                                | 277                                                                                | 288                                                                                 | 60                                                                                  | 11                                                                                  | 152                                                                                 | 8                                                                                   |
| Grp Sat Flow(s),veh/h/ln     | 1612                                                                              | 0                                                                                 | 1569                                                                              | 1289                                                                              | 0                                                                                 | 1806                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 0.4                                                                               | 0.0                                                                               | 1.0                                                                               | 3.2                                                                               | 0.0                                                                               | 1.3                                                                               | 6.1                                                                                | 4.3                                                                                 | 0.9                                                                                 | 0.3                                                                                 | 2.8                                                                                 | 0.2                                                                                 |
| Cycle Q Clear(g_c), s        | 2.1                                                                               | 0.0                                                                               | 1.0                                                                               | 5.3                                                                               | 0.0                                                                               | 1.3                                                                               | 6.1                                                                                | 4.3                                                                                 | 0.9                                                                                 | 0.3                                                                                 | 2.8                                                                                 | 0.2                                                                                 |
| Prop In Lane                 | 0.52                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.17                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 405                                                                               | 0                                                                                 | 265                                                                               | 326                                                                               | 0                                                                                 | 305                                                                               | 364                                                                                | 814                                                                                 | 692                                                                                 | 15                                                                                  | 448                                                                                 | 381                                                                                 |
| V/C Ratio(X)                 | 0.25                                                                              | 0.00                                                                              | 0.17                                                                              | 0.32                                                                              | 0.00                                                                              | 0.21                                                                              | 0.76                                                                               | 0.35                                                                                | 0.09                                                                                | 0.72                                                                                | 0.34                                                                                | 0.02                                                                                |
| Avail Cap(c_a), veh/h        | 1031                                                                              | 0                                                                                 | 907                                                                               | 853                                                                               | 0                                                                                 | 1043                                                                              | 1281                                                                               | 3543                                                                                | 3011                                                                                | 641                                                                                 | 2870                                                                                | 2440                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 15.2                                                                              | 0.0                                                                               | 14.8                                                                              | 17.5                                                                              | 0.0                                                                               | 14.9                                                                              | 15.6                                                                               | 7.8                                                                                 | 6.8                                                                                 | 20.5                                                                                | 13.0                                                                                | 12.0                                                                                |
| Incr Delay (d2), s/veh       | 0.3                                                                               | 0.0                                                                               | 0.3                                                                               | 0.5                                                                               | 0.0                                                                               | 0.3                                                                               | 3.3                                                                                | 0.6                                                                                 | 0.1                                                                                 | 47.6                                                                                | 0.9                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.1                                                                               | 0.0                                                                               | 0.4                                                                               | 1.2                                                                               | 0.0                                                                               | 0.7                                                                               | 3.3                                                                                | 2.3                                                                                 | 0.4                                                                                 | 0.3                                                                                 | 1.6                                                                                 | 0.1                                                                                 |
| LnGrp Delay(d),s/veh         | 15.5                                                                              | 0.0                                                                               | 15.0                                                                              | 18.1                                                                              | 0.0                                                                               | 15.2                                                                              | 18.9                                                                               | 8.3                                                                                 | 7.0                                                                                 | 68.1                                                                                | 14.0                                                                                | 12.1                                                                                |
| LnGrp LOS                    | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                  | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 147                                                                               |                                                                                   |                                                                                   | 168                                                                               |                                                                                   |                                                                                    | 625                                                                                 |                                                                                     |                                                                                     | 171                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 15.4                                                                              |                                                                                   |                                                                                   | 17.0                                                                              |                                                                                   |                                                                                    | 12.9                                                                                |                                                                                     |                                                                                     | 17.4                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.4                                                                               | 24.2                                                                              |                                                                                   | 12.0                                                                              | 13.5                                                                              | 16.0                                                                              |                                                                                    | 12.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 79.0                                                                              |                                                                                   | 24.0                                                                              | 30.0                                                                              | 64.0                                                                              |                                                                                    | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.3                                                                               | 6.3                                                                               |                                                                                   | 4.1                                                                               | 8.1                                                                               | 4.8                                                                               |                                                                                    | 7.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 4.3                                                                               |                                                                                   | 0.6                                                                               | 0.8                                                                               | 1.9                                                                               |                                                                                    | 0.6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 14.5                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 2: Honoapiilani Highway & Hoohui Road

10/05/2017

|                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|--------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                       | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations            |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)         | 60                                                                                | 5                                                                                 | 190                                                                               | 95                                                                                | 20                                                                                | 15                                                                                | 160                                                                               | 600                                                                               | 20                                                                                | 10                                                                                  | 540                                                                                 | 65                                                                                  |
| Future Volume (veh/h)          | 60                                                                                | 5                                                                                 | 190                                                                               | 95                                                                                | 20                                                                                | 15                                                                                | 160                                                                               | 600                                                                               | 20                                                                                | 10                                                                                  | 540                                                                                 | 65                                                                                  |
| Number                         | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                 | 2                                                                                 | 12                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)            | 0.98                                                                              |                                                                                   | 0.98                                                                              | 0.98                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 0.99                                                                                |
| Parking Bus, Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln         | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h           | 65                                                                                | 5                                                                                 | 21                                                                                | 103                                                                               | 22                                                                                | 2                                                                                 | 174                                                                               | 652                                                                               | 0                                                                                 | 11                                                                                  | 587                                                                                 | 29                                                                                  |
| Adj No. of Lanes               | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor               | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %           | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                     | 375                                                                               | 24                                                                                | 311                                                                               | 341                                                                               | 338                                                                               | 31                                                                                | 405                                                                               | 907                                                                               | 771                                                                               | 315                                                                                 | 745                                                                                 | 628                                                                                 |
| Arrive On Green                | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.10                                                                              | 0.49                                                                              | 0.00                                                                              | 0.01                                                                                | 0.40                                                                                | 0.40                                                                                |
| Sat Flow, veh/h                | 1210                                                                              | 120                                                                               | 1544                                                                              | 1350                                                                              | 1679                                                                              | 153                                                                               | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1571                                                                                |
| Grp Volume(v), veh/h           | 70                                                                                | 0                                                                                 | 21                                                                                | 103                                                                               | 0                                                                                 | 24                                                                                | 174                                                                               | 652                                                                               | 0                                                                                 | 11                                                                                  | 587                                                                                 | 29                                                                                  |
| Grp Sat Flow(s),veh/h/ln       | 1330                                                                              | 0                                                                                 | 1544                                                                              | 1350                                                                              | 0                                                                                 | 1831                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1571                                                                                |
| Q Serve(g_s), s                | 2.1                                                                               | 0.0                                                                               | 0.6                                                                               | 3.7                                                                               | 0.0                                                                               | 0.6                                                                               | 2.7                                                                               | 14.6                                                                              | 0.0                                                                               | 0.2                                                                                 | 14.6                                                                                | 0.6                                                                                 |
| Cycle Q Clear(g_c), s          | 2.6                                                                               | 0.0                                                                               | 0.6                                                                               | 6.3                                                                               | 0.0                                                                               | 0.6                                                                               | 2.7                                                                               | 14.6                                                                              | 0.0                                                                               | 0.2                                                                                 | 14.6                                                                                | 0.6                                                                                 |
| Prop In Lane                   | 0.93                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h         | 400                                                                               | 0                                                                                 | 311                                                                               | 341                                                                               | 0                                                                                 | 369                                                                               | 405                                                                               | 907                                                                               | 771                                                                               | 315                                                                                 | 745                                                                                 | 628                                                                                 |
| V/C Ratio(X)                   | 0.18                                                                              | 0.00                                                                              | 0.07                                                                              | 0.30                                                                              | 0.00                                                                              | 0.07                                                                              | 0.43                                                                              | 0.72                                                                              | 0.00                                                                              | 0.03                                                                                | 0.79                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h          | 775                                                                               | 0                                                                                 | 732                                                                               | 709                                                                               | 0                                                                                 | 868                                                                               | 740                                                                               | 1801                                                                              | 1531                                                                              | 804                                                                                 | 1801                                                                                | 1519                                                                                |
| HCM Platoon Ratio              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)             | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh       | 18.0                                                                              | 0.0                                                                               | 17.1                                                                              | 20.6                                                                              | 0.0                                                                               | 17.0                                                                              | 9.7                                                                               | 10.7                                                                              | 0.0                                                                               | 10.3                                                                                | 13.9                                                                                | 9.7                                                                                 |
| Incr Delay (d2), s/veh         | 0.2                                                                               | 0.0                                                                               | 0.1                                                                               | 0.5                                                                               | 0.0                                                                               | 0.1                                                                               | 0.7                                                                               | 1.1                                                                               | 0.0                                                                               | 0.0                                                                                 | 1.9                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh      | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln       | 0.9                                                                               | 0.0                                                                               | 0.3                                                                               | 1.4                                                                               | 0.0                                                                               | 0.3                                                                               | 1.4                                                                               | 7.7                                                                               | 0.0                                                                               | 0.1                                                                                 | 7.7                                                                                 | 0.3                                                                                 |
| LnGrp Delay(d),s/veh           | 18.2                                                                              | 0.0                                                                               | 17.1                                                                              | 21.0                                                                              | 0.0                                                                               | 17.1                                                                              | 10.5                                                                              | 11.8                                                                              | 0.0                                                                               | 10.3                                                                                | 15.8                                                                                | 9.7                                                                                 |
| LnGrp LOS                      | B                                                                                 |                                                                                   | B                                                                                 | C                                                                                 |                                                                                   | B                                                                                 | B                                                                                 | B                                                                                 |                                                                                   | B                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h            | 91                                                                                |                                                                                   | 127                                                                               |                                                                                   |                                                                                   | 826                                                                               |                                                                                   |                                                                                   | 627                                                                               |                                                                                     |                                                                                     |                                                                                     |
| Approach Delay, s/veh          | 18.0                                                                              |                                                                                   | 20.3                                                                              |                                                                                   |                                                                                   | 11.5                                                                              |                                                                                   |                                                                                   | 15.4                                                                              |                                                                                     |                                                                                     |                                                                                     |
| Approach LOS                   | B                                                                                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                     |                                                                                     |                                                                                     |
| Timer                          | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                   | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s       | 5.4                                                                               | 31.7                                                                              |                                                                                   | 15.6                                                                              | 10.0                                                                              | 27.1                                                                              |                                                                                   | 15.6                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s        | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s    | 15.0                                                                              | 51.0                                                                              |                                                                                   | 25.0                                                                              | 15.0                                                                              | 51.0                                                                              |                                                                                   | 25.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+12.2), s | 12.2                                                                              | 16.6                                                                              |                                                                                   | 4.6                                                                               | 4.7                                                                               | 16.6                                                                              |                                                                                   | 8.3                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s        | 0.0                                                                               | 4.9                                                                               |                                                                                   | 0.4                                                                               | 0.3                                                                               | 4.3                                                                               |                                                                                   | 0.3                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay            | 14.0                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 3: Honoapiilani Highway & Akahele Street

10/05/2017

|                                |  |  |  |  |  |  |  |  |  |   |  |  |
|--------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                       | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations            |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)         | 45                                                                                | 20                                                                                | 125                                                                               | 110                                                                               | 45                                                                                | 75                                                                                | 60                                                                                | 650                                                                               | 60                                                                                | 45                                                                                  | 720                                                                                 | 30                                                                                  |
| Future Volume (veh/h)          | 45                                                                                | 20                                                                                | 125                                                                               | 110                                                                               | 45                                                                                | 75                                                                                | 60                                                                                | 650                                                                               | 60                                                                                | 45                                                                                  | 720                                                                                 | 30                                                                                  |
| Number                         | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                 | 2                                                                                 | 12                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)            | 1.00                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln         | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h           | 49                                                                                | 22                                                                                | 7                                                                                 | 120                                                                               | 49                                                                                | 9                                                                                 | 65                                                                                | 707                                                                               | 30                                                                                | 49                                                                                  | 783                                                                                 | 16                                                                                  |
| Adj No. of Lanes               | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor               | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %           | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                     | 63                                                                                | 176                                                                               | 56                                                                                | 155                                                                               | 340                                                                               | 287                                                                               | 85                                                                                | 922                                                                               | 783                                                                               | 63                                                                                  | 898                                                                                 | 764                                                                                 |
| Arrive On Green                | 0.04                                                                              | 0.13                                                                              | 0.13                                                                              | 0.09                                                                              | 0.18                                                                              | 0.18                                                                              | 0.05                                                                              | 0.49                                                                              | 0.49                                                                              | 0.04                                                                                | 0.48                                                                                | 0.48                                                                                |
| Sat Flow, veh/h                | 1774                                                                              | 1350                                                                              | 429                                                                               | 1774                                                                              | 1863                                                                              | 1573                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h           | 49                                                                                | 0                                                                                 | 29                                                                                | 120                                                                               | 49                                                                                | 9                                                                                 | 65                                                                                | 707                                                                               | 30                                                                                | 49                                                                                  | 783                                                                                 | 16                                                                                  |
| Grp Sat Flow(s),veh/h/ln       | 1774                                                                              | 0                                                                                 | 1779                                                                              | 1774                                                                              | 1863                                                                              | 1573                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Q Serve(g_s), s                | 2.2                                                                               | 0.0                                                                               | 1.1                                                                               | 5.2                                                                               | 1.8                                                                               | 0.4                                                                               | 2.9                                                                               | 24.5                                                                              | 0.8                                                                               | 2.2                                                                                 | 29.8                                                                                | 0.4                                                                                 |
| Cycle Q Clear(g_c), s          | 2.2                                                                               | 0.0                                                                               | 1.1                                                                               | 5.2                                                                               | 1.8                                                                               | 0.4                                                                               | 2.9                                                                               | 24.5                                                                              | 0.8                                                                               | 2.2                                                                                 | 29.8                                                                                | 0.4                                                                                 |
| Prop In Lane                   | 1.00                                                                              |                                                                                   | 0.24                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h         | 63                                                                                | 0                                                                                 | 231                                                                               | 155                                                                               | 340                                                                               | 287                                                                               | 85                                                                                | 922                                                                               | 783                                                                               | 63                                                                                  | 898                                                                                 | 764                                                                                 |
| V/C Ratio(X)                   | 0.78                                                                              | 0.00                                                                              | 0.13                                                                              | 0.77                                                                              | 0.14                                                                              | 0.03                                                                              | 0.76                                                                              | 0.77                                                                              | 0.04                                                                              | 0.78                                                                                | 0.87                                                                                | 0.02                                                                                |
| Avail Cap(c_a), veh/h          | 448                                                                               | 0                                                                                 | 471                                                                               | 448                                                                               | 493                                                                               | 417                                                                               | 559                                                                               | 1527                                                                              | 1298                                                                              | 559                                                                                 | 1527                                                                                | 1298                                                                                |
| HCM Platoon Ratio              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)             | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh       | 37.9                                                                              | 0.0                                                                               | 30.5                                                                              | 35.4                                                                              | 27.2                                                                              | 26.7                                                                              | 37.3                                                                              | 16.3                                                                              | 10.3                                                                              | 37.9                                                                                | 18.3                                                                                | 10.7                                                                                |
| Incr Delay (d2), s/veh         | 18.7                                                                              | 0.0                                                                               | 0.2                                                                               | 7.9                                                                               | 0.2                                                                               | 0.0                                                                               | 13.2                                                                              | 1.4                                                                               | 0.0                                                                               | 18.5                                                                                | 3.1                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh      | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln       | 1.4                                                                               | 0.0                                                                               | 0.6                                                                               | 2.9                                                                               | 0.9                                                                               | 0.2                                                                               | 1.7                                                                               | 12.9                                                                              | 0.3                                                                               | 1.4                                                                                 | 16.0                                                                                | 0.2                                                                                 |
| LnGrp Delay(d),s/veh           | 56.6                                                                              | 0.0                                                                               | 30.7                                                                              | 43.3                                                                              | 27.4                                                                              | 26.7                                                                              | 50.5                                                                              | 17.7                                                                              | 10.3                                                                              | 56.4                                                                                | 21.4                                                                                | 10.7                                                                                |
| LnGrp LOS                      | E                                                                                 |                                                                                   | C                                                                                 | D                                                                                 | C                                                                                 | C                                                                                 | D                                                                                 | B                                                                                 | B                                                                                 | E                                                                                   | C                                                                                   | B                                                                                   |
| Approach Vol, veh/h            | 78                                                                                |                                                                                   |                                                                                   |                                                                                   | 178                                                                               |                                                                                   | 802                                                                               |                                                                                   |                                                                                   |                                                                                     | 848                                                                                 |                                                                                     |
| Approach Delay, s/veh          | 47.0                                                                              |                                                                                   |                                                                                   |                                                                                   | 38.1                                                                              |                                                                                   | 20.1                                                                              |                                                                                   |                                                                                   |                                                                                     | 23.2                                                                                |                                                                                     |
| Approach LOS                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                     | C                                                                                   |                                                                                     |
| Timer                          | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                   | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s       | 7.8                                                                               | 44.2                                                                              | 11.9                                                                              | 15.3                                                                              | 8.8                                                                               | 43.2                                                                              | 7.8                                                                               | 19.5                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s        | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s    | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+14.2), s | 14.2                                                                              | 26.5                                                                              | 7.2                                                                               | 3.1                                                                               | 4.9                                                                               | 31.8                                                                              | 4.2                                                                               | 3.8                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s        | 0.1                                                                               | 5.7                                                                               | 0.2                                                                               | 0.1                                                                               | 0.1                                                                               | 6.5                                                                               | 0.1                                                                               | 0.2                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay            |                                                                                   |                                                                                   | 24.3                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                   |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 4: Honoapiilani Highway & Lower Honoapiilani Road

10/05/2017

|                               |                                                                                    |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Movement                      | EBL                                                                                | EBT                                                                               | EBR                                                                               | WBL  | WBT                                                                               | WBR  | NBL                                                                               | NBT                                                                               | NBR  | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                    |  |  |      |  |      |  |  |      |  |  |  |
| Traffic Volume (veh/h)        | 35                                                                                 | 10                                                                                | 480                                                                               | 20   | 5                                                                                 | 0    | 315                                                                               | 755                                                                               | 45   | 10                                                                                  | 960                                                                                 | 15                                                                                  |
| Future Volume (veh/h)         | 35                                                                                 | 10                                                                                | 480                                                                               | 20   | 5                                                                                 | 0    | 315                                                                               | 755                                                                               | 45   | 10                                                                                  | 960                                                                                 | 15                                                                                  |
| Number                        | 3                                                                                  | 8                                                                                 | 18                                                                                | 7    | 4                                                                                 | 14   | 1                                                                                 | 6                                                                                 | 16   | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                  | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 0.99                                                                               |                                                                                   | 1.00                                                                              | 0.99 |                                                                                   | 1.00 | 1.00                                                                              |                                                                                   | 1.00 | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                               | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 38                                                                                 | 11                                                                                | 0                                                                                 | 22   | 5                                                                                 | 0    | 342                                                                               | 821                                                                               | 48   | 11                                                                                  | 1043                                                                                | 7                                                                                   |
| Adj No. of Lanes              | 0                                                                                  | 1                                                                                 | 1                                                                                 | 0    | 1                                                                                 | 0    | 1                                                                                 | 2                                                                                 | 0    | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                               | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                  | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 177                                                                                | 29                                                                                | 110                                                                               | 182  | 29                                                                                | 0    | 403                                                                               | 2340                                                                              | 137  | 15                                                                                  | 1663                                                                                | 744                                                                                 |
| Arrive On Green               | 0.09                                                                               | 0.07                                                                              | 0.00                                                                              | 0.09 | 0.07                                                                              | 0.00 | 0.23                                                                              | 0.69                                                                              | 0.69 | 0.01                                                                                | 0.47                                                                                | 0.47                                                                                |
| Sat Flow, veh/h               | 1111                                                                               | 422                                                                               | 1583                                                                              | 1156 | 416                                                                               | 0    | 1774                                                                              | 3399                                                                              | 199  | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h          | 49                                                                                 | 0                                                                                 | 0                                                                                 | 27   | 0                                                                                 | 0    | 342                                                                               | 427                                                                               | 442  | 11                                                                                  | 1043                                                                                | 7                                                                                   |
| Grp Sat Flow(s),veh/h/ln      | 1533                                                                               | 0                                                                                 | 1583                                                                              | 1572 | 0                                                                                 | 0    | 1774                                                                              | 1770                                                                              | 1828 | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s               | 0.9                                                                                | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0  | 11.9                                                                              | 6.4                                                                               | 6.4  | 0.4                                                                                 | 14.2                                                                                | 0.2                                                                                 |
| Cycle Q Clear(g_c), s         | 1.8                                                                                | 0.0                                                                               | 0.0                                                                               | 0.9  | 0.0                                                                               | 0.0  | 11.9                                                                              | 6.4                                                                               | 6.4  | 0.4                                                                                 | 14.2                                                                                | 0.2                                                                                 |
| Prop In Lane                  | 0.78                                                                               |                                                                                   | 1.00                                                                              | 0.81 |                                                                                   | 0.00 | 1.00                                                                              |                                                                                   | 0.11 | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 230                                                                                | 0                                                                                 | 110                                                                               | 236  | 0                                                                                 | 0    | 403                                                                               | 1219                                                                              | 1259 | 15                                                                                  | 1663                                                                                | 744                                                                                 |
| V/C Ratio(X)                  | 0.21                                                                               | 0.00                                                                              | 0.00                                                                              | 0.11 | 0.00                                                                              | 0.00 | 0.85                                                                              | 0.35                                                                              | 0.35 | 0.74                                                                                | 0.63                                                                                | 0.01                                                                                |
| Avail Cap(c_a), veh/h         | 818                                                                                | 0                                                                                 | 739                                                                               | 747  | 0                                                                                 | 0    | 1960                                                                              | 1570                                                                              | 1621 | 1960                                                                                | 3140                                                                                | 1405                                                                                |
| HCM Platoon Ratio             | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                               | 0.00                                                                              | 0.00                                                                              | 1.00 | 0.00                                                                              | 0.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 28.2                                                                               | 0.0                                                                               | 0.0                                                                               | 27.8 | 0.0                                                                               | 0.0  | 23.8                                                                              | 4.1                                                                               | 4.1  | 31.8                                                                                | 12.8                                                                                | 9.1                                                                                 |
| Incr Delay (d2), s/veh        | 0.5                                                                                | 0.0                                                                               | 0.0                                                                               | 0.2  | 0.0                                                                               | 0.0  | 2.0                                                                               | 0.4                                                                               | 0.4  | 23.7                                                                                | 0.8                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                                | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 0.8                                                                                | 0.0                                                                               | 0.0                                                                               | 0.5  | 0.0                                                                               | 0.0  | 6.0                                                                               | 3.2                                                                               | 3.3  | 0.3                                                                                 | 7.0                                                                                 | 0.1                                                                                 |
| LnGrp Delay(d),s/veh          | 28.7                                                                               | 0.0                                                                               | 0.0                                                                               | 28.0 | 0.0                                                                               | 0.0  | 25.7                                                                              | 4.5                                                                               | 4.5  | 55.5                                                                                | 13.6                                                                                | 9.1                                                                                 |
| LnGrp LOS                     | C                                                                                  |                                                                                   |                                                                                   | C    |                                                                                   |      | C                                                                                 | A                                                                                 | A    | E                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h           | 49                                                                                 |                                                                                   |                                                                                   |      | 27                                                                                |      |                                                                                   |                                                                                   | 1211 |                                                                                     | 1061                                                                                |                                                                                     |
| Approach Delay, s/veh         | 28.7                                                                               |                                                                                   |                                                                                   |      | 28.0                                                                              |      |                                                                                   |                                                                                   | 10.5 |                                                                                     | 14.0                                                                                |                                                                                     |
| Approach LOS                  | C                                                                                  |                                                                                   |                                                                                   |      | C                                                                                 |      |                                                                                   |                                                                                   | B    |                                                                                     | B                                                                                   |                                                                                     |
| Timer                         | 1                                                                                  | 2                                                                                 | 3                                                                                 | 4    | 5                                                                                 | 6    | 7                                                                                 | 8                                                                                 |      |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                  | 2                                                                                 |                                                                                   |      | 4                                                                                 | 5    | 6                                                                                 | 8                                                                                 |      |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 18.6                                                                               | 36.2                                                                              |                                                                                   |      | 9.5                                                                               | 4.5  | 50.2                                                                              | 9.5                                                                               |      |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                                | 6.0                                                                               |                                                                                   |      | 5.0                                                                               | 4.0  | 6.0                                                                               | 5.0                                                                               |      |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 1.0                                                                                | 57.0                                                                              |                                                                                   |      | 27.0                                                                              | 71.0 | 57.0                                                                              | 30.0                                                                              |      |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.0), s | 13.9                                                                               | 16.2                                                                              |                                                                                   |      | 2.9                                                                               | 2.4  | 8.4                                                                               | 3.8                                                                               |      |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.8                                                                                | 13.9                                                                              |                                                                                   |      | 0.1                                                                               | 0.0  | 10.2                                                                              | 0.1                                                                               |      |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                    |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           |                                                                                    |                                                                                   | 12.7                                                                              |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  |                                                                                    |                                                                                   | B                                                                                 |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 5: Honoapiilani Highway & Kai Malina Parkway/Halawai Drive

10/05/2017

|                               |  |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                      | EBL                                                                                | EBT                                                                               | EBR                                                                               | WBL  | WBT                                                                               | WBR  | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                    |  |  |      |  |      |  |  |  |  |  |  |
| Traffic Volume (veh/h)        | 35                                                                                 | 0                                                                                 | 70                                                                                | 10   | 5                                                                                 | 10   | 135                                                                               | 1165                                                                              | 20                                                                                | 20                                                                                  | 1425                                                                                | 70                                                                                  |
| Future Volume (veh/h)         | 35                                                                                 | 0                                                                                 | 70                                                                                | 10   | 5                                                                                 | 10   | 135                                                                               | 1165                                                                              | 20                                                                                | 20                                                                                  | 1425                                                                                | 70                                                                                  |
| Number                        | 3                                                                                  | 8                                                                                 | 18                                                                                | 7    | 4                                                                                 | 14   | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                  | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                               |                                                                                   | 1.00                                                                              | 1.00 |                                                                                   | 1.00 | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                               | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 38                                                                                 | 0                                                                                 | 1                                                                                 | 11   | 5                                                                                 | 1    | 147                                                                               | 1266                                                                              | 21                                                                                | 22                                                                                  | 1549                                                                                | 48                                                                                  |
| Adj No. of Lanes              | 0                                                                                  | 1                                                                                 | 1                                                                                 | 0    | 1                                                                                 | 0    | 1                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                               | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                  | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 166                                                                                | 0                                                                                 | 72                                                                                | 107  | 21                                                                                | 3    | 184                                                                               | 2692                                                                              | 45                                                                                | 26                                                                                  | 2359                                                                                | 1055                                                                                |
| Arrive On Green               | 0.06                                                                               | 0.00                                                                              | 0.05                                                                              | 0.06 | 0.05                                                                              | 0.05 | 0.10                                                                              | 0.76                                                                              | 0.76                                                                              | 0.01                                                                                | 0.67                                                                                | 0.67                                                                                |
| Sat Flow, veh/h               | 1556                                                                               | 0                                                                                 | 1583                                                                              | 643  | 471                                                                               | 70   | 1774                                                                              | 3563                                                                              | 59                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h          | 38                                                                                 | 0                                                                                 | 1                                                                                 | 17   | 0                                                                                 | 0    | 147                                                                               | 629                                                                               | 658                                                                               | 22                                                                                  | 1549                                                                                | 48                                                                                  |
| Grp Sat Flow(s),veh/h/ln      | 1556                                                                               | 0                                                                                 | 1583                                                                              | 1183 | 0                                                                                 | 0    | 1774                                                                              | 1770                                                                              | 1852                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s               | 0.0                                                                                | 0.0                                                                               | 0.0                                                                               | 0.3  | 0.0                                                                               | 0.0  | 6.2                                                                               | 10.2                                                                              | 10.2                                                                              | 0.9                                                                                 | 19.7                                                                                | 0.8                                                                                 |
| Cycle Q Clear(g_c), s         | 1.6                                                                                | 0.0                                                                               | 0.0                                                                               | 1.8  | 0.0                                                                               | 0.0  | 6.2                                                                               | 10.2                                                                              | 10.2                                                                              | 0.9                                                                                 | 19.7                                                                                | 0.8                                                                                 |
| Prop In Lane                  | 1.00                                                                               |                                                                                   | 1.00                                                                              | 0.65 |                                                                                   | 0.06 | 1.00                                                                              |                                                                                   | 0.03                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 186                                                                                | 0                                                                                 | 72                                                                                | 148  | 0                                                                                 | 0    | 184                                                                               | 1337                                                                              | 1399                                                                              | 26                                                                                  | 2359                                                                                | 1055                                                                                |
| V/C Ratio(X)                  | 0.20                                                                               | 0.00                                                                              | 0.01                                                                              | 0.12 | 0.00                                                                              | 0.00 | 0.80                                                                              | 0.47                                                                              | 0.47                                                                              | 0.85                                                                                | 0.66                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h         | 547                                                                                | 0                                                                                 | 479                                                                               | 541  | 0                                                                                 | 0    | 490                                                                               | 2002                                                                              | 2096                                                                              | 257                                                                                 | 3539                                                                                | 1583                                                                                |
| HCM Platoon Ratio             | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                               | 0.00                                                                              | 1.00                                                                              | 1.00 | 0.00                                                                              | 0.00 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 34.9                                                                               | 0.0                                                                               | 34.6                                                                              | 35.0 | 0.0                                                                               | 0.0  | 33.3                                                                              | 3.5                                                                               | 3.5                                                                               | 37.4                                                                                | 7.5                                                                                 | 4.4                                                                                 |
| Incr Delay (d2), s/veh        | 0.2                                                                                | 0.0                                                                               | 0.0                                                                               | 0.1  | 0.0                                                                               | 0.0  | 3.0                                                                               | 0.6                                                                               | 0.5                                                                               | 22.8                                                                                | 0.7                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                                | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 0.8                                                                                | 0.0                                                                               | 0.0                                                                               | 0.3  | 0.0                                                                               | 0.0  | 3.2                                                                               | 5.1                                                                               | 5.3                                                                               | 0.6                                                                                 | 9.7                                                                                 | 0.4                                                                                 |
| LnGrp Delay(d),s/veh          | 35.1                                                                               | 0.0                                                                               | 34.7                                                                              | 35.1 | 0.0                                                                               | 0.0  | 36.3                                                                              | 4.1                                                                               | 4.1                                                                               | 60.2                                                                                | 8.2                                                                                 | 4.4                                                                                 |
| LnGrp LOS                     | D                                                                                  |                                                                                   | C                                                                                 | D    |                                                                                   |      | D                                                                                 | A                                                                                 | A                                                                                 | E                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h           | 39                                                                                 |                                                                                   |                                                                                   | 17   |                                                                                   |      | 1434                                                                              |                                                                                   |                                                                                   | 1619                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 35.1                                                                               |                                                                                   |                                                                                   | 35.1 |                                                                                   |      | 7.4                                                                               |                                                                                   |                                                                                   | 8.8                                                                                 |                                                                                     |                                                                                     |
| Approach LOS                  | D                                                                                  |                                                                                   |                                                                                   | D    |                                                                                   |      | A                                                                                 |                                                                                   |                                                                                   | A                                                                                   |                                                                                     |                                                                                     |
| Timer                         | 1                                                                                  | 2                                                                                 | 3                                                                                 | 4    | 5                                                                                 | 6    | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                  | 2                                                                                 |                                                                                   | 4    | 5                                                                                 | 6    |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 11.9                                                                               | 55.7                                                                              |                                                                                   | 8.5  | 5.1                                                                               | 62.4 |                                                                                   | 8.5                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                                | 5.0                                                                               |                                                                                   | 5.0  | 4.0                                                                               | 5.0  |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 21.0                                                                               | 76.0                                                                              |                                                                                   | 23.0 | 11.0                                                                              | 86.0 |                                                                                   | 23.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.0), s | 19.2                                                                               | 21.7                                                                              |                                                                                   | 3.8  | 2.9                                                                               | 12.2 |                                                                                   | 3.6                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.1                                                                                | 28.9                                                                              |                                                                                   | 0.0  | 0.0                                                                               | 20.9 |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                    |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           | 8.6                                                                                |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  | A                                                                                  |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 6: Honoapiilani Highway & Kai Ala Drive/Puukolii Road

10/05/2017

|                               |                                                                                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Movement                      | EBL                                                                                | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR  | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                    |  |  |  |  |      |  |  |  |  |  |  |
| Traffic Volume (veh/h)        | 60                                                                                 | 5                                                                                 | 35                                                                                | 40                                                                                | 15                                                                                | 50   | 110                                                                               | 1300                                                                              | 60                                                                                | 30                                                                                  | 1365                                                                                | 50                                                                                  |
| Future Volume (veh/h)         | 60                                                                                 | 5                                                                                 | 35                                                                                | 40                                                                                | 15                                                                                | 50   | 110                                                                               | 1300                                                                              | 60                                                                                | 30                                                                                  | 1365                                                                                | 50                                                                                  |
| Number                        | 3                                                                                  | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14   | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                  | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                               |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00 | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                               | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 65                                                                                 | 5                                                                                 | 1                                                                                 | 43                                                                                | 16                                                                                | 1    | 120                                                                               | 1413                                                                              | 48                                                                                | 33                                                                                  | 1484                                                                                | 39                                                                                  |
| Adj No. of Lanes              | 0                                                                                  | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0    | 1                                                                                 | 2                                                                                 | 1                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                               | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                  | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 165                                                                                | 11                                                                                | 158                                                                               | 111                                                                               | 174                                                                               | 11   | 142                                                                               | 2756                                                                              | 1233                                                                              | 43                                                                                  | 2560                                                                                | 1145                                                                                |
| Arrive On Green               | 0.10                                                                               | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.10 | 0.08                                                                              | 0.78                                                                              | 0.78                                                                              | 0.02                                                                                | 0.72                                                                                | 0.72                                                                                |
| Sat Flow, veh/h               | 1202                                                                               | 111                                                                               | 1579                                                                              | 1401                                                                              | 1735                                                                              | 108  | 1774                                                                              | 3539                                                                              | 1583                                                                              | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h          | 70                                                                                 | 0                                                                                 | 1                                                                                 | 43                                                                                | 0                                                                                 | 17   | 120                                                                               | 1413                                                                              | 48                                                                                | 33                                                                                  | 1484                                                                                | 39                                                                                  |
| Grp Sat Flow(s),veh/h/ln      | 1313                                                                               | 0                                                                                 | 1579                                                                              | 1401                                                                              | 0                                                                                 | 1843 | 1774                                                                              | 1770                                                                              | 1583                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s               | 7.1                                                                                | 0.0                                                                               | 0.1                                                                               | 4.7                                                                               | 0.0                                                                               | 1.3  | 10.3                                                                              | 22.8                                                                              | 1.1                                                                               | 2.9                                                                                 | 31.0                                                                                | 1.1                                                                                 |
| Cycle Q Clear(g_c), s         | 8.4                                                                                | 0.0                                                                               | 0.1                                                                               | 13.1                                                                              | 0.0                                                                               | 1.3  | 10.3                                                                              | 22.8                                                                              | 1.1                                                                               | 2.9                                                                                 | 31.0                                                                                | 1.1                                                                                 |
| Prop In Lane                  | 0.93                                                                               |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.06 | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 176                                                                                | 0                                                                                 | 158                                                                               | 111                                                                               | 0                                                                                 | 184  | 142                                                                               | 2756                                                                              | 1233                                                                              | 43                                                                                  | 2560                                                                                | 1145                                                                                |
| V/C Ratio(X)                  | 0.40                                                                               | 0.00                                                                              | 0.01                                                                              | 0.39                                                                              | 0.00                                                                              | 0.09 | 0.85                                                                              | 0.51                                                                              | 0.04                                                                              | 0.76                                                                                | 0.58                                                                                | 0.03                                                                                |
| Avail Cap(c_a), veh/h         | 254                                                                                | 0                                                                                 | 244                                                                               | 187                                                                               | 0                                                                                 | 285  | 240                                                                               | 2756                                                                              | 1233                                                                              | 240                                                                                 | 2560                                                                                | 1145                                                                                |
| HCM Platoon Ratio             | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                               | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00 | 0.71                                                                              | 0.71                                                                              | 0.71                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 67.0                                                                               | 0.0                                                                               | 62.8                                                                              | 72.8                                                                              | 0.0                                                                               | 63.4 | 70.4                                                                              | 6.3                                                                               | 3.9                                                                               | 75.2                                                                                | 10.2                                                                                | 6.1                                                                                 |
| Incr Delay (d2), s/veh        | 1.4                                                                                | 0.0                                                                               | 0.0                                                                               | 2.2                                                                               | 0.0                                                                               | 0.2  | 3.8                                                                               | 0.5                                                                               | 0.0                                                                               | 9.7                                                                                 | 1.0                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                                | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 2.9                                                                                | 0.0                                                                               | 0.0                                                                               | 1.9                                                                               | 0.0                                                                               | 0.7  | 5.2                                                                               | 11.2                                                                              | 0.5                                                                               | 1.5                                                                                 | 15.4                                                                                | 0.5                                                                                 |
| LnGrp Delay(d),s/veh          | 68.5                                                                               | 0.0                                                                               | 62.8                                                                              | 75.0                                                                              | 0.0                                                                               | 63.6 | 74.1                                                                              | 6.8                                                                               | 4.0                                                                               | 84.8                                                                                | 11.2                                                                                | 6.1                                                                                 |
| LnGrp LOS                     | E                                                                                  |                                                                                   | E                                                                                 | E                                                                                 |                                                                                   | E    | E                                                                                 | A                                                                                 | A                                                                                 | F                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h           | 71                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 60   | 1581                                                                              |                                                                                   |                                                                                   | 1556                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 68.4                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 71.8 | 11.8                                                                              |                                                                                   |                                                                                   | 12.6                                                                                |                                                                                     |                                                                                     |
| Approach LOS                  | E                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   | E    | B                                                                                 |                                                                                   |                                                                                   | B                                                                                   |                                                                                     |                                                                                     |
| Timer                         | 1                                                                                  | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6    | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                  | 2                                                                                 |                                                                                   |                                                                                   | 4                                                                                 | 5    | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 16.4                                                                               | 118.1                                                                             |                                                                                   |                                                                                   | 20.5                                                                              | 7.8  | 126.7                                                                             | 20.5                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                                | 6.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 4.0  | 6.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 21.0                                                                               | 95.0                                                                              |                                                                                   |                                                                                   | 24.0                                                                              | 21.0 | 95.0                                                                              | 24.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1/3), s | 12.3                                                                               | 33.0                                                                              |                                                                                   |                                                                                   | 15.1                                                                              | 4.9  | 24.8                                                                              | 10.4                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.1                                                                                | 28.6                                                                              |                                                                                   |                                                                                   | 0.1                                                                               | 0.0  | 27.7                                                                              | 0.1                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           |                                                                                    |                                                                                   | 14.5                                                                              |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  |                                                                                    |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 7: Honoapiilani Highway & Kaanapali Parkway/Halelo Street

10/05/2017

|                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                              |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |  |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)       | 140                                                                               | 10                                                                                | 220                                                                               | 10                                                                                | 10                                                                                | 10                                                                                | 425                                                                               | 1375                                                                              | 15                                                                                | 85                                                                                  | 1300                                                                                | 105                                                                                 |
| Future Volume (veh/h)        | 140                                                                               | 10                                                                                | 220                                                                               | 10                                                                                | 10                                                                                | 10                                                                                | 425                                                                               | 1375                                                                              | 15                                                                                | 85                                                                                  | 1300                                                                                | 105                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 160                                                                               | 0                                                                                 | 61                                                                                | 11                                                                                | 11                                                                                | 3                                                                                 | 462                                                                               | 1495                                                                              | 16                                                                                | 92                                                                                  | 1413                                                                                | 86                                                                                  |
| Adj No. of Lanes             | 2                                                                                 | 0                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 2                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 325                                                                               | 0                                                                                 | 805                                                                               | 59                                                                                | 59                                                                                | 16                                                                                | 598                                                                               | 2186                                                                              | 23                                                                                | 151                                                                                 | 1842                                                                                | 953                                                                                 |
| Arrive On Green              | 0.09                                                                              | 0.00                                                                              | 0.08                                                                              | 0.08                                                                              | 0.08                                                                              | 0.05                                                                              | 0.17                                                                              | 0.61                                                                              | 0.59                                                                              | 0.09                                                                                | 0.52                                                                                | 0.52                                                                                |
| Sat Flow, veh/h              | 3548                                                                              | 0                                                                                 | 3071                                                                              | 783                                                                               | 783                                                                               | 214                                                                               | 3442                                                                              | 3587                                                                              | 38                                                                                | 1774                                                                                | 3539                                                                                | 1578                                                                                |
| Grp Volume(v), veh/h         | 160                                                                               | 0                                                                                 | 61                                                                                | 25                                                                                | 0                                                                                 | 0                                                                                 | 462                                                                               | 737                                                                               | 774                                                                               | 92                                                                                  | 1413                                                                                | 86                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1774                                                                              | 0                                                                                 | 1536                                                                              | 1780                                                                              | 0                                                                                 | 0                                                                                 | 1721                                                                              | 1770                                                                              | 1856                                                                              | 1774                                                                                | 1770                                                                                | 1578                                                                                |
| Q Serve(g_s), s              | 5.0                                                                               | 0.0                                                                               | 1.7                                                                               | 1.5                                                                               | 0.0                                                                               | 0.0                                                                               | 14.8                                                                              | 32.3                                                                              | 32.3                                                                              | 5.8                                                                                 | 36.9                                                                                | 2.6                                                                                 |
| Cycle Q Clear(g_c), s        | 5.0                                                                               | 0.0                                                                               | 1.7                                                                               | 1.5                                                                               | 0.0                                                                               | 0.0                                                                               | 14.8                                                                              | 32.3                                                                              | 32.3                                                                              | 5.8                                                                                 | 36.9                                                                                | 2.6                                                                                 |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.44                                                                              |                                                                                   | 0.12                                                                              | 1.00                                                                              |                                                                                   | 0.02                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 325                                                                               | 0                                                                                 | 805                                                                               | 135                                                                               | 0                                                                                 | 0                                                                                 | 598                                                                               | 1078                                                                              | 1131                                                                              | 151                                                                                 | 1842                                                                                | 953                                                                                 |
| V/C Ratio(X)                 | 0.49                                                                              | 0.00                                                                              | 0.08                                                                              | 0.19                                                                              | 0.00                                                                              | 0.00                                                                              | 0.77                                                                              | 0.68                                                                              | 0.68                                                                              | 0.61                                                                                | 0.77                                                                                | 0.09                                                                                |
| Avail Cap(c_a), veh/h        | 1043                                                                              | 0                                                                                 | 1427                                                                              | 477                                                                               | 0                                                                                 | 0                                                                                 | 1726                                                                              | 2968                                                                              | 3113                                                                              | 230                                                                                 | 4621                                                                                | 2191                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 50.0                                                                              | 0.0                                                                               | 32.6                                                                              | 50.3                                                                              | 0.0                                                                               | 0.0                                                                               | 45.6                                                                              | 15.1                                                                              | 15.2                                                                              | 51.0                                                                                | 22.1                                                                                | 9.6                                                                                 |
| Incr Delay (d2), s/veh       | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 0.8                                                                               | 1.1                                                                               | 1.1                                                                               | 1.5                                                                                 | 1.0                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 2.5                                                                               | 0.0                                                                               | 0.7                                                                               | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 7.1                                                                               | 15.9                                                                              | 16.7                                                                              | 2.9                                                                                 | 18.1                                                                                | 1.4                                                                                 |
| LnGrp Delay(d),s/veh         | 50.4                                                                              | 0.0                                                                               | 32.6                                                                              | 50.9                                                                              | 0.0                                                                               | 0.0                                                                               | 46.4                                                                              | 16.2                                                                              | 16.2                                                                              | 52.5                                                                                | 23.1                                                                                | 9.7                                                                                 |
| LnGrp LOS                    | D                                                                                 |                                                                                   | C                                                                                 | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 | B                                                                                 | B                                                                                 | D                                                                                   | C                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 221                                                                               |                                                                                   |                                                                                   | 25                                                                                |                                                                                   |                                                                                   | 1973                                                                              |                                                                                   |                                                                                   | 1591                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 45.5                                                                              |                                                                                   |                                                                                   | 50.9                                                                              |                                                                                   |                                                                                   | 23.3                                                                              |                                                                                   |                                                                                   | 24.1                                                                                |                                                                                     |                                                                                     |
| Approach LOS                 | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 24.1                                                                              | 64.2                                                                              |                                                                                   | 12.8                                                                              | 13.8                                                                              | 74.5                                                                              |                                                                                   | 14.6                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 6.0                                                                               | 6.0                                                                               |                                                                                   | 7.0                                                                               | 6.0                                                                               | 6.0                                                                               |                                                                                   | 7.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 50.0                                                                              | 149.0                                                                             |                                                                                   | 28.0                                                                              | 13.0                                                                              | 192.0                                                                             |                                                                                   | 31.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+10), s | 10.8                                                                              | 38.9                                                                              |                                                                                   | 3.5                                                                               | 7.8                                                                               | 34.3                                                                              |                                                                                   | 7.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 1.3                                                                               | 19.4                                                                              |                                                                                   | 0.0                                                                               | 0.1                                                                               | 18.4                                                                              |                                                                                   | 0.6                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          | 25.1                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 8: Honoapiilani Highway & Leialii Parkway

10/05/2017

|                               |  |       |      |      |      |       |      |      |      |      |      |      |
|-------------------------------|------------------------------------------------------------------------------------|-------|------|------|------|-------|------|------|------|------|------|------|
| Movement                      | EBL                                                                                | EBT   | EBR  | WBL  | WBT  | WBR   | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations           |                                                                                    | ↔     |      | ↖    | ↗    |       | ↖    | ↗    |      | ↖    | ↗    |      |
| Traffic Volume (veh/h)        | 5                                                                                  | 5     | 5    | 60   | 0    | 45    | 5    | 1810 | 90   | 30   | 1495 | 5    |
| Future Volume (veh/h)         | 5                                                                                  | 5     | 5    | 60   | 0    | 45    | 5    | 1810 | 90   | 30   | 1495 | 5    |
| Number                        | 3                                                                                  | 8     | 18   | 7    | 4    | 14    | 1    | 6    | 16   | 5    | 2    | 12   |
| Initial Q (Qb), veh           | 0                                                                                  | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)           | 0.98                                                                               |       | 0.97 | 0.98 |      | 0.97  | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Parking Bus, Adj              | 1.00                                                                               | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln        | 1900                                                                               | 1863  | 1900 | 1863 | 1863 | 1900  | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h          | 5                                                                                  | 5     | 1    | 65   | 0    | 1     | 5    | 1967 | 96   | 33   | 1625 | 5    |
| Adj No. of Lanes              | 0                                                                                  | 1     | 0    | 1    | 1    | 0     | 1    | 2    | 0    | 1    | 2    | 0    |
| Peak Hour Factor              | 0.92                                                                               | 0.92  | 0.92 | 0.92 | 0.92 | 0.92  | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, %          | 2                                                                                  | 2     | 2    | 2    | 2    | 2     | 2    | 2    | 2    | 2    | 2    | 2    |
| Cap, veh/h                    | 90                                                                                 | 80    | 13   | 176  | 0    | 138   | 11   | 2711 | 131  | 63   | 2962 | 9    |
| Arrive On Green               | 0.09                                                                               | 0.09  | 0.08 | 0.09 | 0.00 | 0.08  | 0.01 | 0.79 | 0.78 | 0.04 | 0.82 | 0.81 |
| Sat Flow, veh/h               | 584                                                                                | 895   | 148  | 1372 | 0    | 1543  | 1774 | 3436 | 166  | 1774 | 3619 | 11   |
| Grp Volume(v), veh/h          | 11                                                                                 | 0     | 0    | 65   | 0    | 1     | 5    | 1005 | 1058 | 33   | 794  | 836  |
| Grp Sat Flow(s),veh/h/ln      | 1627                                                                               | 0     | 0    | 1372 | 0    | 1543  | 1774 | 1770 | 1833 | 1774 | 1770 | 1861 |
| Q Serve(g_s), s               | 0.0                                                                                | 0.0   | 0.0  | 5.4  | 0.0  | 0.1   | 0.4  | 38.8 | 40.4 | 2.6  | 20.7 | 20.7 |
| Cycle Q Clear(g_c), s         | 0.8                                                                                | 0.0   | 0.0  | 6.1  | 0.0  | 0.1   | 0.4  | 38.8 | 40.4 | 2.6  | 20.7 | 20.7 |
| Prop In Lane                  | 0.45                                                                               |       | 0.09 | 1.00 |      | 1.00  | 1.00 |      | 0.09 | 1.00 |      | 0.01 |
| Lane Grp Cap(c), veh/h        | 183                                                                                | 0     | 0    | 176  | 0    | 138   | 11   | 1396 | 1446 | 63   | 1448 | 1523 |
| V/C Ratio(X)                  | 0.06                                                                               | 0.00  | 0.00 | 0.37 | 0.00 | 0.01  | 0.45 | 0.72 | 0.73 | 0.52 | 0.55 | 0.55 |
| Avail Cap(c_a), veh/h         | 312                                                                                | 0     | 0    | 289  | 0    | 265   | 101  | 1396 | 1446 | 101  | 1448 | 1523 |
| HCM Platoon Ratio             | 1.00                                                                               | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I)            | 1.00                                                                               | 0.00  | 0.00 | 1.00 | 0.00 | 1.00  | 0.61 | 0.61 | 0.61 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh      | 58.4                                                                               | 0.0   | 0.0  | 60.7 | 0.0  | 58.5  | 69.3 | 7.2  | 7.4  | 66.3 | 4.2  | 4.2  |
| Incr Delay (d2), s/veh        | 0.1                                                                                | 0.0   | 0.0  | 1.3  | 0.0  | 0.0   | 6.2  | 2.0  | 2.0  | 2.5  | 1.5  | 1.4  |
| Initial Q Delay(d3),s/veh     | 0.0                                                                                | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln      | 0.4                                                                                | 0.0   | 0.0  | 2.5  | 0.0  | 0.0   | 0.2  | 19.5 | 20.8 | 1.3  | 10.5 | 11.1 |
| LnGrp Delay(d),s/veh          | 58.6                                                                               | 0.0   | 0.0  | 62.0 | 0.0  | 58.6  | 75.5 | 9.2  | 9.4  | 68.8 | 5.7  | 5.6  |
| LnGrp LOS                     | E                                                                                  |       |      | E    |      | E     | E    | A    | A    | E    | A    | A    |
| Approach Vol, veh/h           | 11                                                                                 |       |      | 66   |      |       | 2068 |      |      | 1663 |      |      |
| Approach Delay, s/veh         | 58.6                                                                               |       |      | 62.0 |      |       | 9.5  |      |      | 6.9  |      |      |
| Approach LOS                  | E                                                                                  |       |      | E    |      |       | A    |      |      | A    |      |      |
| Timer                         | 1                                                                                  | 2     | 3    | 4    | 5    | 6     | 7    | 8    |      |      |      |      |
| Assigned Phs                  | 1                                                                                  | 2     |      | 4    | 5    | 6     |      | 8    |      |      |      |      |
| Phs Duration (G+Y+Rc), s      | 4.9                                                                                | 118.6 |      | 16.5 | 9.0  | 114.5 |      | 16.5 |      |      |      |      |
| Change Period (Y+Rc), s       | 4.0                                                                                | 5.0   |      | 5.0  | 4.0  | 5.0   |      | 5.0  |      |      |      |      |
| Max Green Setting (Gmax), s   | 95.0                                                                               | 95.0  |      | 23.0 | 8.0  | 95.0  |      | 23.0 |      |      |      |      |
| Max Q Clear Time (g_c+1/4), s | 12.4                                                                               | 22.7  |      | 8.1  | 4.6  | 42.4  |      | 2.8  |      |      |      |      |
| Green Ext Time (p_c), s       | 0.0                                                                                | 33.6  |      | 0.1  | 0.0  | 41.2  |      | 0.0  |      |      |      |      |
| Intersection Summary          |                                                                                    |       |      |      |      |       |      |      |      |      |      |      |
| HCM 2010 Ctrl Delay           | 9.4                                                                                |       |      |      |      |       |      |      |      |      |      |      |
| HCM 2010 LOS                  | A                                                                                  |       |      |      |      |       |      |      |      |      |      |      |



# HCM 2010 Signalized Intersection Summary

## 9: Honoapiilani Highway & Front Street/Flemming Road

10/05/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                   |  |                                                                                   |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)        | 95                                                                                | 5                                                                                 | 5                                                                                 | 105                                                                               | 15                                                                                | 15                                                                                | 5                                                                                 | 1785                                                                              | 20                                                                                | 10                                                                                  | 1325                                                                                | 200                                                                                 |
| Future Volume (veh/h)         | 95                                                                                | 5                                                                                 | 5                                                                                 | 105                                                                               | 15                                                                                | 15                                                                                | 5                                                                                 | 1785                                                                              | 20                                                                                | 10                                                                                  | 1325                                                                                | 200                                                                                 |
| Number                        | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 103                                                                               | 5                                                                                 | 3                                                                                 | 114                                                                               | 16                                                                                | 12                                                                                | 5                                                                                 | 1940                                                                              | 21                                                                                | 11                                                                                  | 1440                                                                                | 157                                                                                 |
| Adj No. of Lanes              | 0                                                                                 | 1                                                                                 | 0                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 210                                                                               | 7                                                                                 | 4                                                                                 | 198                                                                               | 20                                                                                | 15                                                                                | 7                                                                                 | 2809                                                                              | 30                                                                                | 14                                                                                  | 2785                                                                                | 1246                                                                                |
| Arrive On Green               | 0.11                                                                              | 0.11                                                                              | 0.10                                                                              | 0.11                                                                              | 0.11                                                                              | 0.10                                                                              | 0.00                                                                              | 0.78                                                                              | 0.77                                                                              | 0.01                                                                                | 0.79                                                                                | 0.79                                                                                |
| Sat Flow, veh/h               | 1391                                                                              | 68                                                                                | 41                                                                                | 1323                                                                              | 186                                                                               | 139                                                                               | 1774                                                                              | 3587                                                                              | 39                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h          | 111                                                                               | 0                                                                                 | 0                                                                                 | 142                                                                               | 0                                                                                 | 0                                                                                 | 5                                                                                 | 955                                                                               | 1006                                                                              | 11                                                                                  | 1440                                                                                | 157                                                                                 |
| Grp Sat Flow(s),veh/h/ln      | 1499                                                                              | 0                                                                                 | 0                                                                                 | 1647                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                              | 1770                                                                              | 1856                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 1.3                                                                               | 0.0                                                                               | 0.0                                                                               | 0.3                                                                               | 30.5                                                                              | 30.8                                                                              | 0.7                                                                                 | 17.5                                                                                | 2.8                                                                                 |
| Cycle Q Clear(g_c), s         | 8.3                                                                               | 0.0                                                                               | 0.0                                                                               | 9.6                                                                               | 0.0                                                                               | 0.0                                                                               | 0.3                                                                               | 30.5                                                                              | 30.8                                                                              | 0.7                                                                                 | 17.5                                                                                | 2.8                                                                                 |
| Prop In Lane                  | 0.93                                                                              |                                                                                   | 0.03                                                                              | 0.80                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                              |                                                                                   | 0.02                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 221                                                                               | 0                                                                                 | 0                                                                                 | 234                                                                               | 0                                                                                 | 0                                                                                 | 7                                                                                 | 1386                                                                              | 1454                                                                              | 14                                                                                  | 2785                                                                                | 1246                                                                                |
| V/C Ratio(X)                  | 0.50                                                                              | 0.00                                                                              | 0.00                                                                              | 0.61                                                                              | 0.00                                                                              | 0.00                                                                              | 0.73                                                                              | 0.69                                                                              | 0.69                                                                              | 0.81                                                                                | 0.52                                                                                | 0.13                                                                                |
| Avail Cap(c_a), veh/h         | 430                                                                               | 0                                                                                 | 0                                                                                 | 451                                                                               | 0                                                                                 | 0                                                                                 | 118                                                                               | 1386                                                                              | 1454                                                                              | 118                                                                                 | 2785                                                                                | 1246                                                                                |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.61                                                                              | 0.61                                                                              | 0.61                                                                              | 0.83                                                                                | 0.83                                                                                | 0.83                                                                                |
| Uniform Delay (d), s/veh      | 51.3                                                                              | 0.0                                                                               | 0.0                                                                               | 51.9                                                                              | 0.0                                                                               | 0.0                                                                               | 59.7                                                                              | 6.1                                                                               | 6.2                                                                               | 59.5                                                                                | 4.6                                                                                 | 3.0                                                                                 |
| Incr Delay (d2), s/veh        | 1.8                                                                               | 0.0                                                                               | 0.0                                                                               | 2.5                                                                               | 0.0                                                                               | 0.0                                                                               | 28.8                                                                              | 1.7                                                                               | 1.7                                                                               | 27.9                                                                                | 0.6                                                                                 | 0.2                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 8.7                                                                               | 0.0                                                                               | 0.0                                                                               | 4.7                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                               | 15.3                                                                              | 16.0                                                                              | 0.5                                                                                 | 8.6                                                                                 | 1.3                                                                                 |
| LnGrp Delay(d),s/veh          | 53.1                                                                              | 0.0                                                                               | 0.0                                                                               | 54.4                                                                              | 0.0                                                                               | 0.0                                                                               | 88.5                                                                              | 7.9                                                                               | 7.8                                                                               | 87.3                                                                                | 5.2                                                                                 | 3.2                                                                                 |
| LnGrp LOS                     | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | F                                                                                 | A                                                                                 | A                                                                                 | F                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h           |                                                                                   | 111                                                                               |                                                                                   |                                                                                   | 142                                                                               |                                                                                   |                                                                                   | 1966                                                                              |                                                                                   |                                                                                     | 1608                                                                                |                                                                                     |
| Approach Delay, s/veh         |                                                                                   | 53.1                                                                              |                                                                                   |                                                                                   | 54.4                                                                              |                                                                                   |                                                                                   | 8.1                                                                               |                                                                                   |                                                                                     | 5.5                                                                                 |                                                                                     |
| Approach LOS                  |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 4.5                                                                               | 98.4                                                                              |                                                                                   | 17.1                                                                              | 4.9                                                                               | 98.0                                                                              |                                                                                   | 17.1                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 68.0                                                                              | 68.0                                                                              |                                                                                   | 30.0                                                                              | 8.0                                                                               | 68.0                                                                              |                                                                                   | 30.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1/3), s | 19.5                                                                              | 19.5                                                                              |                                                                                   | 11.6                                                                              | 2.7                                                                               | 32.8                                                                              |                                                                                   | 10.3                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.0                                                                               | 33.3                                                                              |                                                                                   | 0.5                                                                               | 0.0                                                                               | 31.6                                                                              |                                                                                   | 0.3                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           | 10.0                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 10: Honoapiilani Highway & Kapunakea Street

10/05/2017

|                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                              |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)       | 150                                                                               | 30                                                                                | 20                                                                                | 145                                                                               | 25                                                                                | 35                                                                                | 25                                                                                | 1605                                                                              | 75                                                                                | 10                                                                                  | 1360                                                                                | 75                                                                                  |
| Future Volume (veh/h)        | 150                                                                               | 30                                                                                | 20                                                                                | 145                                                                               | 25                                                                                | 35                                                                                | 25                                                                                | 1605                                                                              | 75                                                                                | 10                                                                                  | 1360                                                                                | 75                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.98                                                                              | 0.99                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 163                                                                               | 33                                                                                | 2                                                                                 | 158                                                                               | 27                                                                                | 5                                                                                 | 27                                                                                | 1745                                                                              | 80                                                                                | 11                                                                                  | 1478                                                                                | 79                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 234                                                                               | 38                                                                                | 270                                                                               | 313                                                                               | 264                                                                               | 49                                                                                | 34                                                                                | 2529                                                                              | 115                                                                               | 13                                                                                  | 2467                                                                                | 131                                                                                 |
| Arrive On Green              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.04                                                                              | 1.00                                                                              | 1.00                                                                              | 0.01                                                                                | 0.72                                                                                | 0.71                                                                                |
| Sat Flow, veh/h              | 1077                                                                              | 218                                                                               | 1559                                                                              | 1359                                                                              | 1525                                                                              | 282                                                                               | 1774                                                                              | 3447                                                                              | 157                                                                               | 1774                                                                                | 3418                                                                                | 182                                                                                 |
| Grp Volume(v), veh/h         | 196                                                                               | 0                                                                                 | 2                                                                                 | 158                                                                               | 0                                                                                 | 32                                                                                | 27                                                                                | 891                                                                               | 934                                                                               | 11                                                                                  | 763                                                                                 | 794                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1295                                                                              | 0                                                                                 | 1559                                                                              | 1359                                                                              | 0                                                                                 | 1807                                                                              | 1774                                                                              | 1770                                                                              | 1835                                                                              | 1774                                                                                | 1770                                                                                | 1831                                                                                |
| Q Serve(g_s), s              | 18.9                                                                              | 0.0                                                                               | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 2.1                                                                               | 2.1                                                                               | 0.0                                                                               | 0.0                                                                               | 0.9                                                                                 | 29.5                                                                                | 29.9                                                                                |
| Cycle Q Clear(g_c), s        | 21.0                                                                              | 0.0                                                                               | 0.1                                                                               | 13.3                                                                              | 0.0                                                                               | 2.1                                                                               | 2.1                                                                               | 0.0                                                                               | 0.0                                                                               | 0.9                                                                                 | 29.5                                                                                | 29.9                                                                                |
| Prop In Lane                 | 0.83                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.16                                                                              | 1.00                                                                              |                                                                                   | 0.09                                                                              | 1.00                                                                                |                                                                                     | 0.10                                                                                |
| Lane Grp Cap(c), veh/h       | 272                                                                               | 0                                                                                 | 270                                                                               | 313                                                                               | 0                                                                                 | 313                                                                               | 34                                                                                | 1298                                                                              | 1346                                                                              | 13                                                                                  | 1277                                                                                | 1321                                                                                |
| V/C Ratio(X)                 | 0.72                                                                              | 0.00                                                                              | 0.01                                                                              | 0.50                                                                              | 0.00                                                                              | 0.10                                                                              | 0.79                                                                              | 0.69                                                                              | 0.69                                                                              | 0.83                                                                                | 0.60                                                                                | 0.60                                                                                |
| Avail Cap(c_a), veh/h        | 309                                                                               | 0                                                                                 | 312                                                                               | 350                                                                               | 0                                                                                 | 361                                                                               | 139                                                                               | 1298                                                                              | 1346                                                                              | 139                                                                                 | 1277                                                                                | 1321                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 2.00                                                                              | 2.00                                                                              | 2.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.42                                                                              | 0.42                                                                              | 0.42                                                                              | 0.83                                                                                | 0.83                                                                                | 0.83                                                                                |
| Uniform Delay (d), s/veh     | 57.5                                                                              | 0.0                                                                               | 47.9                                                                              | 53.3                                                                              | 0.0                                                                               | 48.8                                                                              | 67.0                                                                              | 0.0                                                                               | 0.0                                                                               | 69.4                                                                                | 9.5                                                                                 | 9.6                                                                                 |
| Incr Delay (d2), s/veh       | 6.9                                                                               | 0.0                                                                               | 0.0                                                                               | 1.3                                                                               | 0.0                                                                               | 0.1                                                                               | 6.5                                                                               | 1.3                                                                               | 1.3                                                                               | 31.5                                                                                | 1.7                                                                                 | 1.7                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 7.9                                                                               | 0.0                                                                               | 0.1                                                                               | 5.7                                                                               | 0.0                                                                               | 1.1                                                                               | 1.1                                                                               | 0.5                                                                               | 0.5                                                                               | 0.5                                                                                 | 14.8                                                                                | 15.6                                                                                |
| LnGrp Delay(d),s/veh         | 64.5                                                                              | 0.0                                                                               | 47.9                                                                              | 54.6                                                                              | 0.0                                                                               | 48.9                                                                              | 73.5                                                                              | 1.3                                                                               | 1.3                                                                               | 100.9                                                                               | 11.2                                                                                | 11.3                                                                                |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 |                                                                                   | D                                                                                 | E                                                                                 | A                                                                                 | A                                                                                 | F                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          | 198                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 190                                                                               |                                                                                   | 1852                                                                              |                                                                                   | 1568                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 64.3                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 53.6                                                                              |                                                                                   | 2.3                                                                               |                                                                                   | 11.9                                                                                |                                                                                     |                                                                                     |
| Approach LOS                 | E                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                   | A                                                                                 |                                                                                   | B                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 4                                                                                 |                                                                                   | 5                                                                                 | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 6.7                                                                               | 105.1                                                                             | 28.3                                                                              |                                                                                   | 5.0                                                                               | 106.7                                                                             | 28.3                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 11.0                                                                              | 88.0                                                                              | 27.0                                                                              |                                                                                   | 11.0                                                                              | 88.0                                                                              | 27.0                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+14), s | 14.1                                                                              | 31.9                                                                              | 15.3                                                                              |                                                                                   | 2.9                                                                               | 2.0                                                                               | 23.0                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 27.7                                                                              | 0.5                                                                               |                                                                                   | 0.0                                                                               | 46.3                                                                              | 0.3                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 12.0                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 11: Honoapiilani Highway & Keawe Street

10/05/2017

|                              |  |      |      |      |      |      |      |      |      |      |      |      |
|------------------------------|------------------------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Movement                     | EBL                                                                                | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations          |                                                                                    | ↩    | ↩    | ↩    | ↩    | ↩    | ↩    | ↩    | ↩    | ↩    | ↩    | ↩    |
| Traffic Volume (veh/h)       | 15                                                                                 | 110  | 35   | 95   | 75   | 740  | 25   | 895  | 120  | 550  | 915  | 20   |
| Future Volume (veh/h)        | 15                                                                                 | 110  | 35   | 95   | 75   | 740  | 25   | 895  | 120  | 550  | 915  | 20   |
| Number                       | 7                                                                                  | 4    | 14   | 3    | 8    | 18   | 1    | 6    | 16   | 5    | 2    | 12   |
| Initial Q (Qb), veh          | 0                                                                                  | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                               |      | 0.99 | 0.99 |      | 0.99 | 1.00 |      | 0.99 | 1.00 |      | 1.00 |
| Parking Bus, Adj             | 1.00                                                                               | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln       | 1900                                                                               | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h         | 16                                                                                 | 120  | 5    | 103  | 82   | 476  | 27   | 973  | 51   | 598  | 995  | 21   |
| Adj No. of Lanes             | 0                                                                                  | 1    | 1    | 1    | 1    | 1    | 1    | 2    | 1    | 2    | 2    | 0    |
| Peak Hour Factor             | 0.92                                                                               | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, %         | 2                                                                                  | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |
| Cap, veh/h                   | 55                                                                                 | 373  | 363  | 381  | 606  | 511  | 34   | 1416 | 630  | 650  | 2019 | 43   |
| Arrive On Green              | 0.23                                                                               | 0.23 | 0.23 | 0.06 | 0.33 | 0.33 | 0.02 | 0.40 | 0.40 | 0.38 | 1.00 | 1.00 |
| Sat Flow, veh/h              | 115                                                                                | 1609 | 1565 | 1774 | 1863 | 1570 | 1774 | 3539 | 1575 | 3442 | 3544 | 75   |
| Grp Volume(v), veh/h         | 136                                                                                | 0    | 5    | 103  | 82   | 476  | 27   | 973  | 51   | 598  | 497  | 519  |
| Grp Sat Flow(s),veh/h/ln     | 1724                                                                               | 0    | 1565 | 1774 | 1863 | 1570 | 1774 | 1770 | 1575 | 1721 | 1770 | 1849 |
| Q Serve(g_s), s              | 0.0                                                                                | 0.0  | 0.3  | 5.9  | 4.3  | 41.1 | 2.1  | 31.9 | 2.8  | 23.2 | 0.0  | 0.0  |
| Cycle Q Clear(g_c), s        | 8.5                                                                                | 0.0  | 0.3  | 5.9  | 4.3  | 41.1 | 2.1  | 31.9 | 2.8  | 23.2 | 0.0  | 0.0  |
| Prop In Lane                 | 0.12                                                                               |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 0.04 |
| Lane Grp Cap(c), veh/h       | 429                                                                                | 0    | 363  | 381  | 606  | 511  | 34   | 1416 | 630  | 650  | 1008 | 1054 |
| V/C Ratio(X)                 | 0.32                                                                               | 0.00 | 0.01 | 0.27 | 0.14 | 0.93 | 0.79 | 0.69 | 0.08 | 0.92 | 0.49 | 0.49 |
| Avail Cap(c_a), veh/h        | 429                                                                                | 0    | 363  | 558  | 665  | 561  | 177  | 1416 | 630  | 836  | 1008 | 1054 |
| HCM Platoon Ratio            | 1.00                                                                               | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 |
| Upstream Filter(I)           | 1.00                                                                               | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.79 | 0.79 | 0.79 | 0.69 | 0.69 | 0.69 |
| Uniform Delay (d), s/veh     | 44.5                                                                               | 0.0  | 41.4 | 35.7 | 33.3 | 45.7 | 68.4 | 34.8 | 26.0 | 42.5 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh       | 0.4                                                                                | 0.0  | 0.0  | 0.4  | 0.1  | 21.5 | 11.4 | 2.2  | 0.2  | 8.4  | 1.2  | 1.1  |
| Initial Q Delay(d3),s/veh    | 0.0                                                                                | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln     | 4.4                                                                                | 0.0  | 0.2  | 2.9  | 2.2  | 20.8 | 1.2  | 16.0 | 1.3  | 11.7 | 0.3  | 0.3  |
| LnGrp Delay(d),s/veh         | 44.9                                                                               | 0.0  | 41.4 | 36.1 | 33.4 | 67.3 | 79.8 | 36.9 | 26.2 | 51.0 | 1.2  | 1.1  |
| LnGrp LOS                    | D                                                                                  |      | D    | D    | C    | E    | E    | D    | C    | D    | A    | A    |
| Approach Vol, veh/h          |                                                                                    | 141  |      |      | 661  |      |      | 1051 |      |      | 1614 |      |
| Approach Delay, s/veh        |                                                                                    | 44.8 |      |      | 58.2 |      |      | 37.5 |      |      | 19.6 |      |
| Approach LOS                 |                                                                                    | D    |      |      | E    |      |      | D    |      |      | B    |      |
| Timer                        | 1                                                                                  | 2    | 3    | 4    | 5    | 6    | 7    | 8    |      |      |      |      |
| Assigned Phs                 | 1                                                                                  | 2    | 3    | 4    | 5    | 6    |      | 8    |      |      |      |      |
| Phs Duration (G+Y+Rc), s     | 6.7                                                                                | 83.8 | 13.1 | 36.5 | 30.5 | 60.0 |      | 49.6 |      |      |      |      |
| Change Period (Y+Rc), s      | 4.0                                                                                | 5.0  | 5.0  | 5.0  | 4.0  | 5.0  |      | 5.0  |      |      |      |      |
| Max Green Setting (Gmax), s  | 14.0                                                                               | 63.0 | 22.0 | 22.0 | 34.0 | 43.0 |      | 49.0 |      |      |      |      |
| Max Q Clear Time (g_c+14), s | 14.0                                                                               | 2.0  | 7.9  | 10.5 | 25.2 | 33.9 |      | 43.1 |      |      |      |      |
| Green Ext Time (p_c), s      | 0.0                                                                                | 13.3 | 0.3  | 0.4  | 1.3  | 5.6  |      | 1.5  |      |      |      |      |
| Intersection Summary         |                                                                                    |      |      |      |      |      |      |      |      |      |      |      |
| HCM 2010 Ctrl Delay          |                                                                                    |      | 33.4 |      |      |      |      |      |      |      |      |      |
| HCM 2010 LOS                 |                                                                                    |      | C    |      |      |      |      |      |      |      |      |      |
| Notes                        |                                                                                    |      |      |      |      |      |      |      |      |      |      |      |

HCM 2010 TWSC  
12: RIRO Access & Honoapiilani Highway

10/05/2017

| Intersection             |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
|--------------------------|--------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh         | 0.1    |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
| Movement                 | WBL    | WBR                                                                               | NBT                                                                               | NBR                                                                               | SBL    | SBT                                                                                 |
| Lane Configurations      |        |  |  |  |        |  |
| Traffic Vol, veh/h       | 0      | 15                                                                                | 745                                                                               | 25                                                                                | 0      | 830                                                                                 |
| Future Vol, veh/h        | 0      | 15                                                                                | 745                                                                               | 25                                                                                | 0      | 830                                                                                 |
| Conflicting Peds, #/hr   | 0      | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0      | 0                                                                                   |
| Sign Control             | Stop   | Stop                                                                              | Free                                                                              | Free                                                                              | Free   | Free                                                                                |
| RT Channelized           | -      | None                                                                              | -                                                                                 | None                                                                              | -      | None                                                                                |
| Storage Length           | -      | 0                                                                                 | -                                                                                 | 0                                                                                 | -      | -                                                                                   |
| Veh in Median Storage, # | 0      | -                                                                                 | 0                                                                                 | -                                                                                 | -      | 0                                                                                   |
| Grade, %                 | 0      | -                                                                                 | 0                                                                                 | -                                                                                 | -      | 0                                                                                   |
| Peak Hour Factor         | 92     | 92                                                                                | 92                                                                                | 92                                                                                | 92     | 92                                                                                  |
| Heavy Vehicles, %        | 2      | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2      | 2                                                                                   |
| Mvmt Flow                | 0      | 16                                                                                | 810                                                                               | 27                                                                                | 0      | 902                                                                                 |
|                          |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
| Major/Minor              | Minor1 |                                                                                   | Major1                                                                            |                                                                                   | Major2 |                                                                                     |
| Conflicting Flow All     | -      | 810                                                                               | 0                                                                                 | 0                                                                                 | -      | -                                                                                   |
| Stage 1                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Stage 2                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Critical Hdwy            | -      | 6.22                                                                              | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Critical Hdwy Stg 1      | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Critical Hdwy Stg 2      | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Follow-up Hdwy           | -      | 3.318                                                                             | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Pot Cap-1 Maneuver       | 0      | 380                                                                               | -                                                                                 | -                                                                                 | 0      | -                                                                                   |
| Stage 1                  | 0      | -                                                                                 | -                                                                                 | -                                                                                 | 0      | -                                                                                   |
| Stage 2                  | 0      | -                                                                                 | -                                                                                 | -                                                                                 | 0      | -                                                                                   |
| Platoon blocked, %       |        |                                                                                   | -                                                                                 | -                                                                                 |        | -                                                                                   |
| Mov Cap-1 Maneuver       | -      | 380                                                                               | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Mov Cap-2 Maneuver       | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Stage 1                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Stage 2                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
|                          |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
|                          |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
| Approach                 | WB     |                                                                                   | NB                                                                                |                                                                                   | SB     |                                                                                     |
| HCM Control Delay, s     | 14.9   |                                                                                   | 0                                                                                 |                                                                                   | 0      |                                                                                     |
| HCM LOS                  | B      |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
|                          |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
| Minor Lane/Major Mvmt    | NBT    | NBRWBLn1                                                                          | SBT                                                                               |                                                                                   |        |                                                                                     |
| Capacity (veh/h)         | -      | - 380                                                                             | -                                                                                 |                                                                                   |        |                                                                                     |
| HCM Lane V/C Ratio       | -      | - 0.043                                                                           | -                                                                                 |                                                                                   |        |                                                                                     |
| HCM Control Delay (s)    | -      | - 14.9                                                                            | -                                                                                 |                                                                                   |        |                                                                                     |
| HCM Lane LOS             | -      | - B                                                                               | -                                                                                 |                                                                                   |        |                                                                                     |
| HCM 95th %tile Q(veh)    | -      | - 0.1                                                                             | -                                                                                 |                                                                                   |        |                                                                                     |

HCM 2010 TWSC  
13: Honoapiilani Highway & Road J

10/05/2017

| Intersection             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh         | 1.5                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Movement                 | WBL                                                                               | WBR                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 |
| Lane Configurations      |  |  |  |  |  |  |
| Traffic Vol, veh/h       | 65                                                                                | 35                                                                                | 770                                                                               | 20                                                                                | 10                                                                                  | 945                                                                                 |
| Future Vol, veh/h        | 65                                                                                | 35                                                                                | 770                                                                               | 20                                                                                | 10                                                                                  | 945                                                                                 |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   |
| Sign Control             | Stop                                                                              | Stop                                                                              | Free                                                                              | Free                                                                              | Free                                                                                | Free                                                                                |
| RT Channelized           | -                                                                                 | None                                                                              | -                                                                                 | None                                                                              | -                                                                                   | None                                                                                |
| Storage Length           | 0                                                                                 | 100                                                                               | -                                                                                 | 100                                                                               | 100                                                                                 | -                                                                                   |
| Veh in Median Storage, # | 0                                                                                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                   | 0                                                                                   |
| Grade, %                 | 0                                                                                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                   | 0                                                                                   |
| Peak Hour Factor         | 92                                                                                | 92                                                                                | 92                                                                                | 92                                                                                | 92                                                                                  | 92                                                                                  |
| Heavy Vehicles, %        | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   |
| Mvmt Flow                | 71                                                                                | 38                                                                                | 837                                                                               | 22                                                                                | 11                                                                                  | 1027                                                                                |
| Major/Minor              | Minor1                                                                            |                                                                                   | Major1                                                                            |                                                                                   | Major2                                                                              |                                                                                     |
| Conflicting Flow All     | 1886                                                                              | 837                                                                               | 0                                                                                 | 0                                                                                 | 859                                                                                 | 0                                                                                   |
| Stage 1                  | 837                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 2                  | 1049                                                                              | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Critical Hdwy            | 6.42                                                                              | 6.22                                                                              | -                                                                                 | -                                                                                 | 4.12                                                                                | -                                                                                   |
| Critical Hdwy Stg 1      | 5.42                                                                              | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Critical Hdwy Stg 2      | 5.42                                                                              | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Follow-up Hdwy           | 3.518                                                                             | 3.318                                                                             | -                                                                                 | -                                                                                 | 2.218                                                                               | -                                                                                   |
| Pot Cap-1 Maneuver       | 78                                                                                | 367                                                                               | -                                                                                 | -                                                                                 | 782                                                                                 | -                                                                                   |
| Stage 1                  | 425                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 2                  | 337                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Platoon blocked, %       |                                                                                   |                                                                                   | -                                                                                 | -                                                                                 |                                                                                     | -                                                                                   |
| Mov Cap-1 Maneuver       | 77                                                                                | 367                                                                               | -                                                                                 | -                                                                                 | 782                                                                                 | -                                                                                   |
| Mov Cap-2 Maneuver       | 202                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 1                  | 419                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 2                  | 337                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Approach                 | WB                                                                                |                                                                                   | NB                                                                                |                                                                                   | SB                                                                                  |                                                                                     |
| HCM Control Delay, s     | 26.4                                                                              |                                                                                   | 0                                                                                 |                                                                                   | 0.1                                                                                 |                                                                                     |
| HCM LOS                  | D                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Minor Lane/Major Mvmt    | NBT                                                                               | NBRWBLn1WBLn2                                                                     | SBL                                                                               | SBT                                                                               |                                                                                     |                                                                                     |
| Capacity (veh/h)         | -                                                                                 | - 202 367                                                                         | 782                                                                               | -                                                                                 |                                                                                     |                                                                                     |
| HCM Lane V/C Ratio       | -                                                                                 | - 0.35 0.104                                                                      | 0.014                                                                             | -                                                                                 |                                                                                     |                                                                                     |
| HCM Control Delay (s)    | -                                                                                 | - 32.1 15.9                                                                       | 9.7                                                                               | -                                                                                 |                                                                                     |                                                                                     |
| HCM Lane LOS             | -                                                                                 | - D C                                                                             | A                                                                                 | -                                                                                 |                                                                                     |                                                                                     |
| HCM 95th %tile Q(veh)    | -                                                                                 | - 1.5 0.3                                                                         | 0                                                                                 | -                                                                                 |                                                                                     |                                                                                     |

HCM 2010 TWSC  
14: Road A & Akahele Street

10/05/2017

| Intersection             |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|--------|-------------------------------------------------------------------------------------|-------|--------|-------------------------------------------------------------------------------------|-------|
| Int Delay, s/veh         | 4.7                                                                               |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Movement                 | EBL                                                                               | EBT                                                                               | EBR  | WBL                                                                               | WBT                                                                               | WBR  | NBL    | NBT                                                                                 | NBR   | SBL    | SBT                                                                                 | SBR   |
| Lane Configurations      |  |  |      |  |  |      |        |  |       |        |  |       |
| Traffic Vol, veh/h       | 50                                                                                | 45                                                                                | 30   | 5                                                                                 | 115                                                                               | 5    | 40     | 5                                                                                   | 5     | 5      | 5                                                                                   | 70    |
| Future Vol, veh/h        | 50                                                                                | 45                                                                                | 30   | 5                                                                                 | 115                                                                               | 5    | 40     | 5                                                                                   | 5     | 5      | 5                                                                                   | 70    |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0      | 0                                                                                   | 0     | 0      | 0                                                                                   | 0     |
| Sign Control             | Free                                                                              | Free                                                                              | Free | Free                                                                              | Free                                                                              | Free | Stop   | Stop                                                                                | Stop  | Stop   | Stop                                                                                | Stop  |
| RT Channelized           | -                                                                                 | -                                                                                 | None | -                                                                                 | -                                                                                 | None | -      | -                                                                                   | None  | -      | -                                                                                   | None  |
| Storage Length           | 100                                                                               | -                                                                                 | -    | 100                                                                               | -                                                                                 | -    | -      | -                                                                                   | -     | -      | -                                                                                   | -     |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | -    | -                                                                                 | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Grade, %                 | -                                                                                 | 0                                                                                 | -    | -                                                                                 | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Peak Hour Factor         | 92                                                                                | 92                                                                                | 92   | 92                                                                                | 92                                                                                | 92   | 92     | 92                                                                                  | 92    | 92     | 92                                                                                  | 92    |
| Heavy Vehicles, %        | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    | 2      | 2                                                                                   | 2     | 2      | 2                                                                                   | 2     |
| Mvmt Flow                | 54                                                                                | 49                                                                                | 33   | 5                                                                                 | 125                                                                               | 5    | 43     | 5                                                                                   | 5     | 5      | 5                                                                                   | 76    |
|                          |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Major/Minor              | Major1                                                                            |                                                                                   |      | Major2                                                                            |                                                                                   |      | Minor1 |                                                                                     |       | Minor2 |                                                                                     |       |
| Conflicting Flow All     | 130                                                                               | 0                                                                                 | 0    | 82                                                                                | 0                                                                                 | 0    | 352    | 314                                                                                 | 66    | 317    | 328                                                                                 | 128   |
| Stage 1                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 174    | 174                                                                                 | -     | 138    | 138                                                                                 | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 178    | 140                                                                                 | -     | 179    | 190                                                                                 | -     |
| Critical Hdwy            | 4.12                                                                              | -                                                                                 | -    | 4.12                                                                              | -                                                                                 | -    | 7.12   | 6.52                                                                                | 6.22  | 7.12   | 6.52                                                                                | 6.22  |
| Critical Hdwy Stg 1      | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Critical Hdwy Stg 2      | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Follow-up Hdwy           | 2.218                                                                             | -                                                                                 | -    | 2.218                                                                             | -                                                                                 | -    | 3.518  | 4.018                                                                               | 3.318 | 3.518  | 4.018                                                                               | 3.318 |
| Pot Cap-1 Maneuver       | 1455                                                                              | -                                                                                 | -    | 1515                                                                              | -                                                                                 | -    | 603    | 601                                                                                 | 998   | 636    | 591                                                                                 | 922   |
| Stage 1                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 828    | 755                                                                                 | -     | 865    | 782                                                                                 | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 824    | 781                                                                                 | -     | 823    | 743                                                                                 | -     |
| Platoon blocked, %       |                                                                                   | -                                                                                 | -    |                                                                                   | -                                                                                 | -    |        |                                                                                     |       |        |                                                                                     |       |
| Mov Cap-1 Maneuver       | 1455                                                                              | -                                                                                 | -    | 1515                                                                              | -                                                                                 | -    | 532    | 577                                                                                 | 998   | 609    | 567                                                                                 | 922   |
| Mov Cap-2 Maneuver       | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 532    | 577                                                                                 | -     | 609    | 567                                                                                 | -     |
| Stage 1                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 797    | 727                                                                                 | -     | 833    | 780                                                                                 | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 748    | 779                                                                                 | -     | 782    | 716                                                                                 | -     |
|                          |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Approach                 | EB                                                                                |                                                                                   |      | WB                                                                                |                                                                                   |      | NB     |                                                                                     |       | SB     |                                                                                     |       |
| HCM Control Delay, s     | 3                                                                                 |                                                                                   |      | 0.3                                                                               |                                                                                   |      | 12.1   |                                                                                     |       | 9.7    |                                                                                     |       |
| HCM LOS                  |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      | B      |                                                                                     |       | A      |                                                                                     |       |
|                          |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Minor Lane/Major Mvmt    | NBLn1                                                                             | EBL                                                                               | EBT  | EBR                                                                               | WBL                                                                               | WBT  | WBR    | SBLn1                                                                               |       |        |                                                                                     |       |
| Capacity (veh/h)         | 563                                                                               | 1455                                                                              | -    | -                                                                                 | 1515                                                                              | -    | -      | 861                                                                                 |       |        |                                                                                     |       |
| HCM Lane V/C Ratio       | 0.097                                                                             | 0.037                                                                             | -    | -                                                                                 | 0.004                                                                             | -    | -      | 0.101                                                                               |       |        |                                                                                     |       |
| HCM Control Delay (s)    | 12.1                                                                              | 7.6                                                                               | -    | -                                                                                 | 7.4                                                                               | -    | -      | 9.7                                                                                 |       |        |                                                                                     |       |
| HCM Lane LOS             | B                                                                                 | A                                                                                 | -    | -                                                                                 | A                                                                                 | -    | -      | A                                                                                   |       |        |                                                                                     |       |
| HCM 95th %tile Q(veh)    | 0.3                                                                               | 0.1                                                                               | -    | -                                                                                 | 0                                                                                 | -    | -      | 0.3                                                                                 |       |        |                                                                                     |       |

| Intersection             |        |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
|--------------------------|--------|-----------------------------------------------------------------------------------|------|--------|-----------------------------------------------------------------------------------|------|--------|-------------------------------------------------------------------------------------|-------|--------|-------------------------------------------------------------------------------------|-------|
| Int Delay, s/veh         | 6.5    |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Movement                 | EBL    | EBT                                                                               | EBR  | WBL    | WBT                                                                               | WBR  | NBL    | NBT                                                                                 | NBR   | SBL    | SBT                                                                                 | SBR   |
| Lane Configurations      |        |  |      |        |  |      |        |  |       |        |  |       |
| Traffic Vol, veh/h       | 10     | 20                                                                                | 25   | 5      | 10                                                                                | 5    | 80     | 5                                                                                   | 5     | 5      | 5                                                                                   | 30    |
| Future Vol, veh/h        | 10     | 20                                                                                | 25   | 5      | 10                                                                                | 5    | 80     | 5                                                                                   | 5     | 5      | 5                                                                                   | 30    |
| Conflicting Peds, #/hr   | 0      | 0                                                                                 | 0    | 0      | 0                                                                                 | 0    | 0      | 0                                                                                   | 0     | 0      | 0                                                                                   | 0     |
| Sign Control             | Free   | Free                                                                              | Free | Free   | Free                                                                              | Free | Stop   | Stop                                                                                | Stop  | Stop   | Stop                                                                                | Stop  |
| RT Channelized           | -      | -                                                                                 | None | -      | -                                                                                 | None | -      | -                                                                                   | None  | -      | -                                                                                   | None  |
| Storage Length           | -      | -                                                                                 | -    | -      | -                                                                                 | -    | -      | -                                                                                   | -     | -      | -                                                                                   | -     |
| Veh in Median Storage, # | -      | 0                                                                                 | -    | -      | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Grade, %                 | -      | 0                                                                                 | -    | -      | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Peak Hour Factor         | 92     | 92                                                                                | 92   | 92     | 92                                                                                | 92   | 92     | 92                                                                                  | 92    | 92     | 92                                                                                  | 92    |
| Heavy Vehicles, %        | 2      | 2                                                                                 | 2    | 2      | 2                                                                                 | 2    | 2      | 2                                                                                   | 2     | 2      | 2                                                                                   | 2     |
| Mvmt Flow                | 11     | 22                                                                                | 27   | 5      | 11                                                                                | 5    | 87     | 5                                                                                   | 5     | 5      | 5                                                                                   | 33    |
|                          |        |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Major/Minor              | Major1 |                                                                                   |      | Major2 |                                                                                   |      | Minor1 |                                                                                     |       | Minor2 |                                                                                     |       |
| Conflicting Flow All     | 16     | 0                                                                                 | 0    | 49     | 0                                                                                 | 0    | 101    | 84                                                                                  | 36    | 87     | 95                                                                                  | 14    |
| Stage 1                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 58     | 58                                                                                  | -     | 24     | 24                                                                                  | -     |
| Stage 2                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 43     | 26                                                                                  | -     | 63     | 71                                                                                  | -     |
| Critical Hdwy            | 4.12   | -                                                                                 | -    | 4.12   | -                                                                                 | -    | 7.12   | 6.52                                                                                | 6.22  | 7.12   | 6.52                                                                                | 6.22  |
| Critical Hdwy Stg 1      | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Critical Hdwy Stg 2      | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Follow-up Hdwy           | 2.218  | -                                                                                 | -    | 2.218  | -                                                                                 | -    | 3.518  | 4.018                                                                               | 3.318 | 3.518  | 4.018                                                                               | 3.318 |
| Pot Cap-1 Maneuver       | 1602   | -                                                                                 | -    | 1558   | -                                                                                 | -    | 880    | 806                                                                                 | 1037  | 899    | 795                                                                                 | 1066  |
| Stage 1                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 954    | 847                                                                                 | -     | 994    | 875                                                                                 | -     |
| Stage 2                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 971    | 874                                                                                 | -     | 948    | 836                                                                                 | -     |
| Platoon blocked, %       |        | -                                                                                 | -    |        | -                                                                                 | -    |        |                                                                                     |       |        |                                                                                     |       |
| Mov Cap-1 Maneuver       | 1602   | -                                                                                 | -    | 1558   | -                                                                                 | -    | 842    | 798                                                                                 | 1037  | 883    | 787                                                                                 | 1066  |
| Mov Cap-2 Maneuver       | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 842    | 798                                                                                 | -     | 883    | 787                                                                                 | -     |
| Stage 1                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 947    | 841                                                                                 | -     | 987    | 872                                                                                 | -     |
| Stage 2                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 933    | 871                                                                                 | -     | 930    | 830                                                                                 | -     |
|                          |        |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Approach                 | EB     |                                                                                   |      | WB     |                                                                                   |      | NB     |                                                                                     |       | SB     |                                                                                     |       |
| HCM Control Delay, s     | 1.3    |                                                                                   |      | 1.8    |                                                                                   |      | 9.8    |                                                                                     |       | 8.8    |                                                                                     |       |
| HCM LOS                  |        |                                                                                   |      |        |                                                                                   |      | A      |                                                                                     |       | A      |                                                                                     |       |
|                          |        |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Minor Lane/Major Mvmt    | NBLn1  | EBL                                                                               | EBT  | EBR    | WBL                                                                               | WBT  | WBR    | SBLn1                                                                               |       |        |                                                                                     |       |
| Capacity (veh/h)         | 848    | 1602                                                                              | -    | -      | 1558                                                                              | -    | -      | 996                                                                                 |       |        |                                                                                     |       |
| HCM Lane V/C Ratio       | 0.115  | 0.007                                                                             | -    | -      | 0.003                                                                             | -    | -      | 0.044                                                                               |       |        |                                                                                     |       |
| HCM Control Delay (s)    | 9.8    | 7.3                                                                               | 0    | -      | 7.3                                                                               | 0    | -      | 8.8                                                                                 |       |        |                                                                                     |       |
| HCM Lane LOS             | A      | A                                                                                 | A    | -      | A                                                                                 | A    | -      | A                                                                                   |       |        |                                                                                     |       |
| HCM 95th %tile O(veh)    | 0.4    | 0                                                                                 | -    | -      | 0                                                                                 | -    | -      | 0.1                                                                                 |       |        |                                                                                     |       |

| Intersection             |                                                                                   |      |        |                                                                                   |                                                                                     |       |
|--------------------------|-----------------------------------------------------------------------------------|------|--------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------|
| Int Delay, s/veh         | 2.1                                                                               |      |        |                                                                                   |                                                                                     |       |
| Movement                 | EBT                                                                               | EBR  | WBL    | WBT                                                                               | NBL                                                                                 | NBR   |
| Lane Configurations      |  |      |        |  |  |       |
| Traffic Vol, veh/h       | 20                                                                                | 10   | 5      | 75                                                                                | 25                                                                                  | 5     |
| Future Vol, veh/h        | 20                                                                                | 10   | 5      | 75                                                                                | 25                                                                                  | 5     |
| Conflicting Peds, #/hr   | 0                                                                                 | 0    | 0      | 0                                                                                 | 0                                                                                   | 0     |
| Sign Control             | Free                                                                              | Free | Free   | Free                                                                              | Stop                                                                                | Stop  |
| RT Channelized           | -                                                                                 | None | -      | None                                                                              | -                                                                                   | Stop  |
| Storage Length           | -                                                                                 | -    | -      | -                                                                                 | 0                                                                                   | -     |
| Veh in Median Storage, # | 0                                                                                 | -    | -      | 0                                                                                 | 0                                                                                   | -     |
| Grade, %                 | 0                                                                                 | -    | -      | 0                                                                                 | 0                                                                                   | -     |
| Peak Hour Factor         | 92                                                                                | 92   | 92     | 92                                                                                | 92                                                                                  | 92    |
| Heavy Vehicles, %        | 2                                                                                 | 2    | 2      | 2                                                                                 | 2                                                                                   | 2     |
| Mvmt Flow                | 22                                                                                | 11   | 5      | 82                                                                                | 27                                                                                  | 5     |
| Major/Minor              | Major1                                                                            |      | Major2 |                                                                                   | Minor1                                                                              |       |
| Conflicting Flow All     | 0                                                                                 | 0    | 33     | 0                                                                                 | 120                                                                                 | 28    |
| Stage 1                  | -                                                                                 | -    | -      | -                                                                                 | 28                                                                                  | -     |
| Stage 2                  | -                                                                                 | -    | -      | -                                                                                 | 92                                                                                  | -     |
| Critical Hdwy            | -                                                                                 | -    | 4.12   | -                                                                                 | 6.42                                                                                | 6.22  |
| Critical Hdwy Stg 1      | -                                                                                 | -    | -      | -                                                                                 | 5.42                                                                                | -     |
| Critical Hdwy Stg 2      | -                                                                                 | -    | -      | -                                                                                 | 5.42                                                                                | -     |
| Follow-up Hdwy           | -                                                                                 | -    | 2.218  | -                                                                                 | 3.518                                                                               | 3.318 |
| Pot Cap-1 Maneuver       | -                                                                                 | -    | 1579   | -                                                                                 | 876                                                                                 | 1047  |
| Stage 1                  | -                                                                                 | -    | -      | -                                                                                 | 995                                                                                 | -     |
| Stage 2                  | -                                                                                 | -    | -      | -                                                                                 | 932                                                                                 | -     |
| Platoon blocked, %       | -                                                                                 | -    | -      | -                                                                                 | -                                                                                   | -     |
| Mov Cap-1 Maneuver       | -                                                                                 | -    | 1579   | -                                                                                 | 873                                                                                 | 1047  |
| Mov Cap-2 Maneuver       | -                                                                                 | -    | -      | -                                                                                 | 873                                                                                 | -     |
| Stage 1                  | -                                                                                 | -    | -      | -                                                                                 | 992                                                                                 | -     |
| Stage 2                  | -                                                                                 | -    | -      | -                                                                                 | 932                                                                                 | -     |
| Approach                 | EB                                                                                |      | WB     |                                                                                   | NB                                                                                  |       |
| HCM Control Delay, s     | 0                                                                                 |      | 0.5    |                                                                                   | 8.5                                                                                 |       |
| HCM LOS                  |                                                                                   |      |        |                                                                                   | A                                                                                   |       |
| Minor Lane/Major Mvmt    | NBLn1                                                                             | EBT  | EBR    | WBL                                                                               | WBT                                                                                 |       |
| Capacity (veh/h)         | 1048                                                                              | -    | -      | 1579                                                                              | -                                                                                   |       |
| HCM Lane V/C Ratio       | 0.031                                                                             | -    | -      | 0.003                                                                             | -                                                                                   |       |
| HCM Control Delay (s)    | 8.5                                                                               | -    | -      | 7.3                                                                               | 0                                                                                   |       |
| HCM Lane LOS             | A                                                                                 | -    | -      | A                                                                                 | A                                                                                   |       |
| HCM 95th %tile Q(veh)    | 0.1                                                                               | -    | -      | 0                                                                                 | -                                                                                   |       |

HCM 2010 Roundabout  
17: Road F & Road J

10/05/2017

| Intersection                |       |       |       |
|-----------------------------|-------|-------|-------|
| Intersection Delay, s/veh   | 3.6   |       |       |
| Intersection LOS            | A     |       |       |
| Approach                    | EB    | WB    | NB    |
| Entry Lanes                 | 1     | 1     | 1     |
| Conflicting Circle Lanes    | 1     | 1     | 1     |
| Adj Approach Flow, veh/h    | 27    | 48    | 43    |
| Demand Flow Rate, veh/h     | 27    | 49    | 44    |
| Vehicles Circulating, veh/h | 5     | 39    | 16    |
| Vehicles Exiting, veh/h     | 83    | 21    | 16    |
| Follow-Up Headway, s        | 3.186 | 3.186 | 3.186 |
| Ped Vol Crossing Leg, #/h   | 0     | 0     | 0     |
| Ped Cap Adj                 | 1.000 | 1.000 | 1.000 |
| Approach Delay, s/veh       | 3.4   | 3.8   | 3.6   |
| Approach LOS                | A     | A     | A     |
| Lane                        | Left  | Left  | Left  |
| Designated Moves            | TR    | LT    | LR    |
| Assumed Moves               | TR    | LT    | LR    |
| RT Channelized              |       |       |       |
| Lane Util                   | 1.000 | 1.000 | 1.000 |
| Critical Headway, s         | 5.193 | 5.193 | 5.193 |
| Entry Flow, veh/h           | 27    | 49    | 44    |
| Cap Entry Lane, veh/h       | 1124  | 1087  | 1112  |
| Entry HV Adj Factor         | 0.988 | 0.982 | 0.977 |
| Flow Entry, veh/h           | 27    | 48    | 43    |
| Cap Entry, veh/h            | 1111  | 1068  | 1087  |
| V/C Ratio                   | 0.024 | 0.045 | 0.040 |
| Control Delay, s/veh        | 3.4   | 3.8   | 3.6   |
| LOS                         | A     | A     | A     |
| 95th %tile Queue, veh       | 0     | 0     | 0     |





---

## **APPENDIX C**

### LEVEL OF SERVICE CALCULATIONS

- Future Year 2022 Scenario 3 PM Peak
-

# HCM 2010 Signalized Intersection Summary

## 1: Napilihau Street

10/05/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 55                                                                                | 25                                                                                | 420                                                                               | 65                                                                                | 25                                                                                | 5                                                                                 | 420                                                                                 | 240                                                                                 | 70                                                                                  | 10                                                                                  | 315                                                                                 | 75                                                                                  |
| Future Volume (veh/h)        | 55                                                                                | 25                                                                                | 420                                                                               | 65                                                                                | 25                                                                                | 5                                                                                 | 420                                                                                 | 240                                                                                 | 70                                                                                  | 10                                                                                  | 315                                                                                 | 75                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 60                                                                                | 27                                                                                | 29                                                                                | 71                                                                                | 27                                                                                | 1                                                                                 | 457                                                                                 | 261                                                                                 | 48                                                                                  | 11                                                                                  | 342                                                                                 | 21                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 216                                                                               | 70                                                                                | 179                                                                               | 216                                                                               | 202                                                                               | 7                                                                                 | 537                                                                                 | 1082                                                                                | 920                                                                                 | 15                                                                                  | 534                                                                                 | 454                                                                                 |
| Arrive On Green              | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.30                                                                                | 0.58                                                                                | 0.58                                                                                | 0.01                                                                                | 0.29                                                                                | 0.29                                                                                |
| Sat Flow, veh/h              | 909                                                                               | 621                                                                               | 1583                                                                              | 1342                                                                              | 1785                                                                              | 66                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 87                                                                                | 0                                                                                 | 29                                                                                | 71                                                                                | 0                                                                                 | 28                                                                                | 457                                                                                 | 261                                                                                 | 48                                                                                  | 11                                                                                  | 342                                                                                 | 21                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1529                                                                              | 0                                                                                 | 1583                                                                              | 1342                                                                              | 0                                                                                 | 1851                                                                              | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 2.1                                                                               | 0.0                                                                               | 0.9                                                                               | 2.8                                                                               | 0.0                                                                               | 0.7                                                                               | 13.0                                                                                | 3.7                                                                                 | 0.7                                                                                 | 0.3                                                                                 | 8.6                                                                                 | 0.5                                                                                 |
| Cycle Q Clear(g_c), s        | 2.8                                                                               | 0.0                                                                               | 0.9                                                                               | 5.6                                                                               | 0.0                                                                               | 0.7                                                                               | 13.0                                                                                | 3.7                                                                                 | 0.7                                                                                 | 0.3                                                                                 | 8.6                                                                                 | 0.5                                                                                 |
| Prop In Lane                 | 0.69                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.04                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 286                                                                               | 0                                                                                 | 179                                                                               | 216                                                                               | 0                                                                                 | 209                                                                               | 537                                                                                 | 1082                                                                                | 920                                                                                 | 15                                                                                  | 534                                                                                 | 454                                                                                 |
| V/C Ratio(X)                 | 0.30                                                                              | 0.00                                                                              | 0.16                                                                              | 0.33                                                                              | 0.00                                                                              | 0.13                                                                              | 0.85                                                                                | 0.24                                                                                | 0.05                                                                                | 0.73                                                                                | 0.64                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h        | 785                                                                               | 0                                                                                 | 707                                                                               | 663                                                                               | 0                                                                                 | 826                                                                               | 990                                                                                 | 2738                                                                                | 2327                                                                                | 495                                                                                 | 2218                                                                                | 1885                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 22.3                                                                              | 0.0                                                                               | 21.5                                                                              | 25.0                                                                              | 0.0                                                                               | 21.5                                                                              | 17.6                                                                                | 5.5                                                                                 | 4.9                                                                                 | 26.6                                                                                | 16.8                                                                                | 13.9                                                                                |
| Incr Delay (d2), s/veh       | 0.6                                                                               | 0.0                                                                               | 0.4                                                                               | 0.9                                                                               | 0.0                                                                               | 0.3                                                                               | 3.9                                                                                 | 0.2                                                                                 | 0.0                                                                                 | 50.3                                                                                | 2.7                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.3                                                                               | 0.0                                                                               | 0.4                                                                               | 1.1                                                                               | 0.0                                                                               | 0.4                                                                               | 6.9                                                                                 | 2.0                                                                                 | 0.3                                                                                 | 0.4                                                                                 | 4.8                                                                                 | 0.2                                                                                 |
| LnGrp Delay(d),s/veh         | 22.9                                                                              | 0.0                                                                               | 22.0                                                                              | 25.9                                                                              | 0.0                                                                               | 21.8                                                                              | 21.5                                                                                | 5.7                                                                                 | 4.9                                                                                 | 76.9                                                                                | 19.5                                                                                | 14.0                                                                                |
| LnGrp LOS                    | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 116                                                                               |                                                                                   |                                                                                   | 99                                                                                |                                                                                   |                                                                                     | 766                                                                                 |                                                                                     |                                                                                     | 374                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 22.7                                                                              |                                                                                   |                                                                                   | 24.7                                                                              |                                                                                   |                                                                                     | 15.1                                                                                |                                                                                     |                                                                                     | 20.9                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.5                                                                               | 37.2                                                                              |                                                                                   | 11.1                                                                              | 21.3                                                                              | 21.4                                                                              |                                                                                     | 11.1                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 79.0                                                                              |                                                                                   | 24.0                                                                              | 30.0                                                                              | 64.0                                                                              |                                                                                     | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.3                                                                               | 5.7                                                                               |                                                                                   | 4.8                                                                               | 15.0                                                                              | 10.6                                                                              |                                                                                     | 7.6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 3.8                                                                               |                                                                                   | 0.5                                                                               | 1.3                                                                               | 4.8                                                                               |                                                                                     | 0.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 18.0                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 2: Hoohui Road

10/05/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)        | 75                                                                                | 20                                                                                | 175                                                                               | 55                                                                                | 15                                                                                | 10                                                                                | 220                                                                               | 655                                                                               | 50                                                                                | 25                                                                                  | 665                                                                                 | 80                                                                                  |
| Future Volume (veh/h)         | 75                                                                                | 20                                                                                | 175                                                                               | 55                                                                                | 15                                                                                | 10                                                                                | 220                                                                               | 655                                                                               | 50                                                                                | 25                                                                                  | 665                                                                                 | 80                                                                                  |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                 | 2                                                                                 | 12                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 82                                                                                | 22                                                                                | 14                                                                                | 60                                                                                | 16                                                                                | 1                                                                                 | 239                                                                               | 712                                                                               | 0                                                                                 | 27                                                                                  | 723                                                                                 | 48                                                                                  |
| Adj No. of Lanes              | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 263                                                                               | 58                                                                                | 218                                                                               | 231                                                                               | 238                                                                               | 15                                                                                | 408                                                                               | 1038                                                                              | 883                                                                               | 370                                                                                 | 881                                                                                 | 746                                                                                 |
| Arrive On Green               | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.10                                                                              | 0.56                                                                              | 0.00                                                                              | 0.02                                                                                | 0.47                                                                                | 0.47                                                                                |
| Sat Flow, veh/h               | 1077                                                                              | 419                                                                               | 1583                                                                              | 1367                                                                              | 1735                                                                              | 108                                                                               | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1577                                                                                |
| Grp Volume(v), veh/h          | 104                                                                               | 0                                                                                 | 14                                                                                | 60                                                                                | 0                                                                                 | 17                                                                                | 239                                                                               | 712                                                                               | 0                                                                                 | 27                                                                                  | 723                                                                                 | 48                                                                                  |
| Grp Sat Flow(s),veh/h/ln      | 1497                                                                              | 0                                                                                 | 1583                                                                              | 1367                                                                              | 0                                                                                 | 1844                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1577                                                                                |
| Q Serve(g_s), s               | 3.0                                                                               | 0.0                                                                               | 0.4                                                                               | 2.4                                                                               | 0.0                                                                               | 0.4                                                                               | 3.4                                                                               | 15.3                                                                              | 0.0                                                                               | 0.4                                                                                 | 18.6                                                                                | 0.9                                                                                 |
| Cycle Q Clear(g_c), s         | 3.5                                                                               | 0.0                                                                               | 0.4                                                                               | 5.9                                                                               | 0.0                                                                               | 0.4                                                                               | 3.4                                                                               | 15.3                                                                              | 0.0                                                                               | 0.4                                                                                 | 18.6                                                                                | 0.9                                                                                 |
| Prop In Lane                  | 0.79                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 321                                                                               | 0                                                                                 | 218                                                                               | 231                                                                               | 0                                                                                 | 253                                                                               | 408                                                                               | 1038                                                                              | 883                                                                               | 370                                                                                 | 881                                                                                 | 746                                                                                 |
| V/C Ratio(X)                  | 0.32                                                                              | 0.00                                                                              | 0.06                                                                              | 0.26                                                                              | 0.00                                                                              | 0.07                                                                              | 0.59                                                                              | 0.69                                                                              | 0.00                                                                              | 0.07                                                                                | 0.82                                                                                | 0.06                                                                                |
| Avail Cap(c_a), veh/h         | 778                                                                               | 0                                                                                 | 710                                                                               | 656                                                                               | 0                                                                                 | 826                                                                               | 702                                                                               | 1703                                                                              | 1448                                                                              | 814                                                                                 | 1703                                                                                | 1442                                                                                |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 22.2                                                                              | 0.0                                                                               | 20.9                                                                              | 25.0                                                                              | 0.0                                                                               | 20.9                                                                              | 10.5                                                                              | 8.8                                                                               | 0.0                                                                               | 8.4                                                                                 | 12.7                                                                                | 8.0                                                                                 |
| Incr Delay (d2), s/veh        | 0.6                                                                               | 0.0                                                                               | 0.1                                                                               | 0.6                                                                               | 0.0                                                                               | 0.1                                                                               | 1.3                                                                               | 0.8                                                                               | 0.0                                                                               | 0.1                                                                                 | 2.0                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 1.5                                                                               | 0.0                                                                               | 0.2                                                                               | 0.9                                                                               | 0.0                                                                               | 0.2                                                                               | 2.0                                                                               | 7.9                                                                               | 0.0                                                                               | 0.2                                                                                 | 9.9                                                                                 | 0.4                                                                                 |
| LnGrp Delay(d),s/veh          | 22.8                                                                              | 0.0                                                                               | 21.1                                                                              | 25.6                                                                              | 0.0                                                                               | 21.1                                                                              | 11.8                                                                              | 9.7                                                                               | 0.0                                                                               | 8.4                                                                                 | 14.6                                                                                | 8.0                                                                                 |
| LnGrp LOS                     | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                 |                                                                                   | C                                                                                 | B                                                                                 | A                                                                                 |                                                                                   | A                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h           | 118                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 77                                                                                |                                                                                   | 951                                                                               |                                                                                   | 798                                                                                 |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 22.6                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 24.6                                                                              |                                                                                   | 10.2                                                                              |                                                                                   | 14.0                                                                                |                                                                                     |                                                                                     |
| Approach LOS                  | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   | C                                                                                 |                                                                                   | B                                                                                 |                                                                                   | B                                                                                   |                                                                                     |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 |                                                                                   |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 6.0                                                                               | 37.1                                                                              |                                                                                   |                                                                                   | 12.7                                                                              | 10.7                                                                              | 32.4                                                                              | 12.7                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 5.0                                                                               | 6.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 15.0                                                                              | 51.0                                                                              |                                                                                   |                                                                                   | 25.0                                                                              | 15.0                                                                              | 51.0                                                                              | 25.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.5), s | 12.4                                                                              | 17.3                                                                              |                                                                                   |                                                                                   | 5.5                                                                               | 5.4                                                                               | 20.6                                                                              | 7.9                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.0                                                                               | 5.5                                                                               |                                                                                   |                                                                                   | 0.5                                                                               | 0.5                                                                               | 5.7                                                                               | 0.2                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           |                                                                                   |                                                                                   | 13.1                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 3: Honoapiilani Highway & Akahele Street

10/05/2017

|                             |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                    | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations         |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)      | 60                                                                                | 50                                                                                | 100                                                                               | 130                                                                               | 50                                                                                | 60                                                                                | 170                                                                               | 870                                                                               | 135                                                                               | 110                                                                                | 785                                                                                 | 75                                                                                  |
| Future Volume (veh/h)       | 60                                                                                | 50                                                                                | 100                                                                               | 130                                                                               | 50                                                                                | 60                                                                                | 170                                                                               | 870                                                                               | 135                                                                               | 110                                                                                | 785                                                                                 | 75                                                                                  |
| Number                      | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                 | 2                                                                                 | 12                                                                                | 1                                                                                  | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh         | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)         | 1.00                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln      | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h        | 65                                                                                | 54                                                                                | 56                                                                                | 141                                                                               | 54                                                                                | 6                                                                                 | 185                                                                               | 946                                                                               | 101                                                                               | 120                                                                                | 853                                                                                 | 36                                                                                  |
| Adj No. of Lanes            | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor            | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %        | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                  | 85                                                                                | 86                                                                                | 89                                                                                | 171                                                                               | 286                                                                               | 240                                                                               | 218                                                                               | 1001                                                                              | 851                                                                               | 150                                                                                | 930                                                                                 | 789                                                                                 |
| Arrive On Green             | 0.05                                                                              | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.15                                                                              | 0.15                                                                              | 0.12                                                                              | 0.54                                                                              | 0.54                                                                              | 0.08                                                                               | 0.50                                                                                | 0.50                                                                                |
| Sat Flow, veh/h             | 1774                                                                              | 823                                                                               | 854                                                                               | 1774                                                                              | 1863                                                                              | 1562                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                               | 1863                                                                                | 1580                                                                                |
| Grp Volume(v), veh/h        | 65                                                                                | 0                                                                                 | 110                                                                               | 141                                                                               | 54                                                                                | 6                                                                                 | 185                                                                               | 946                                                                               | 101                                                                               | 120                                                                                | 853                                                                                 | 36                                                                                  |
| Grp Sat Flow(s),veh/h/ln    | 1774                                                                              | 0                                                                                 | 1677                                                                              | 1774                                                                              | 1863                                                                              | 1562                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                               | 1863                                                                                | 1580                                                                                |
| Q Serve(g_s), s             | 4.1                                                                               | 0.0                                                                               | 7.1                                                                               | 8.8                                                                               | 2.9                                                                               | 0.4                                                                               | 11.5                                                                              | 53.9                                                                              | 3.6                                                                               | 7.5                                                                                | 47.8                                                                                | 1.3                                                                                 |
| Cycle Q Clear(g_c), s       | 4.1                                                                               | 0.0                                                                               | 7.1                                                                               | 8.8                                                                               | 2.9                                                                               | 0.4                                                                               | 11.5                                                                              | 53.9                                                                              | 3.6                                                                               | 7.5                                                                                | 47.8                                                                                | 1.3                                                                                 |
| Prop In Lane                | 1.00                                                                              |                                                                                   | 0.51                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h      | 85                                                                                | 0                                                                                 | 175                                                                               | 171                                                                               | 286                                                                               | 240                                                                               | 218                                                                               | 1001                                                                              | 851                                                                               | 150                                                                                | 930                                                                                 | 789                                                                                 |
| V/C Ratio(X)                | 0.77                                                                              | 0.00                                                                              | 0.63                                                                              | 0.82                                                                              | 0.19                                                                              | 0.03                                                                              | 0.85                                                                              | 0.94                                                                              | 0.12                                                                              | 0.80                                                                               | 0.92                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h       | 314                                                                               | 0                                                                                 | 312                                                                               | 314                                                                               | 347                                                                               | 291                                                                               | 393                                                                               | 1073                                                                              | 912                                                                               | 393                                                                                | 1073                                                                                | 910                                                                                 |
| HCM Platoon Ratio           | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)          | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh    | 53.1                                                                              | 0.0                                                                               | 48.4                                                                              | 50.0                                                                              | 41.7                                                                              | 40.6                                                                              | 48.5                                                                              | 24.5                                                                              | 12.9                                                                              | 50.8                                                                               | 26.1                                                                                | 14.5                                                                                |
| Incr Delay (d2), s/veh      | 13.5                                                                              | 0.0                                                                               | 3.7                                                                               | 9.5                                                                               | 0.3                                                                               | 0.0                                                                               | 8.9                                                                               | 15.5                                                                              | 0.1                                                                               | 9.6                                                                                | 11.2                                                                                | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh   | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln    | 2.3                                                                               | 0.0                                                                               | 3.5                                                                               | 4.8                                                                               | 1.5                                                                               | 0.2                                                                               | 6.2                                                                               | 31.9                                                                              | 1.6                                                                               | 4.1                                                                                | 27.3                                                                                | 0.6                                                                                 |
| LnGrp Delay(d),s/veh        | 66.7                                                                              | 0.0                                                                               | 52.1                                                                              | 59.5                                                                              | 42.0                                                                              | 40.6                                                                              | 57.4                                                                              | 40.0                                                                              | 13.0                                                                              | 60.3                                                                               | 37.4                                                                                | 14.5                                                                                |
| LnGrp LOS                   | E                                                                                 |                                                                                   | D                                                                                 | E                                                                                 | D                                                                                 | D                                                                                 | E                                                                                 | D                                                                                 | B                                                                                 | E                                                                                  | D                                                                                   | B                                                                                   |
| Approach Vol, veh/h         | 175                                                                               |                                                                                   |                                                                                   |                                                                                   | 201                                                                               |                                                                                   |                                                                                   |                                                                                   | 1232                                                                              |                                                                                    | 1009                                                                                |                                                                                     |
| Approach Delay, s/veh       | 57.5                                                                              |                                                                                   |                                                                                   |                                                                                   | 54.2                                                                              |                                                                                   |                                                                                   |                                                                                   | 40.4                                                                              |                                                                                    | 39.3                                                                                |                                                                                     |
| Approach LOS                | E                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                    | D                                                                                   |                                                                                     |
| Timer                       | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| Assigned Phs                | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s    | 14.5                                                                              | 65.7                                                                              | 15.9                                                                              | 16.8                                                                              | 18.8                                                                              | 61.3                                                                              | 10.4                                                                              | 22.3                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s     | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1), s | 19.5                                                                              | 55.9                                                                              | 10.8                                                                              | 9.1                                                                               | 13.5                                                                              | 49.8                                                                              | 6.1                                                                               | 4.9                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s     | 0.2                                                                               | 4.8                                                                               | 0.2                                                                               | 0.4                                                                               | 0.4                                                                               | 5.6                                                                               | 0.1                                                                               | 0.2                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| Intersection Summary        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay         |                                                                                   |                                                                                   | 42.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| HCM 2010 LOS                |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| Notes                       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 4: Honoapiilani Highway & Lower Honoapiilani Road

10/05/2017

|                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-----------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                             |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                    | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations         |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)      | 95                                                                                | 5                                                                                 | 600                                                                               | 80                                                                                | 10                                                                                | 10                                                                                | 605                                                                               | 1095                                                                              | 10                                                                                | 5                                                                                   | 955                                                                                 | 20                                                                                  |
| Future Volume (veh/h)       | 95                                                                                | 5                                                                                 | 600                                                                               | 80                                                                                | 10                                                                                | 10                                                                                | 605                                                                               | 1095                                                                              | 10                                                                                | 5                                                                                   | 955                                                                                 | 20                                                                                  |
| Number                      | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh         | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)         | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln      | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h        | 103                                                                               | 5                                                                                 | 0                                                                                 | 87                                                                                | 11                                                                                | 9                                                                                 | 658                                                                               | 1190                                                                              | 11                                                                                | 5                                                                                   | 1038                                                                                | 6                                                                                   |
| Adj No. of Lanes            | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor            | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %        | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                  | 192                                                                               | 6                                                                                 | 138                                                                               | 180                                                                               | 15                                                                                | 12                                                                                | 696                                                                               | 2770                                                                              | 26                                                                                | 7                                                                                   | 1354                                                                                | 606                                                                                 |
| Arrive On Green             | 0.10                                                                              | 0.09                                                                              | 0.00                                                                              | 0.10                                                                              | 0.09                                                                              | 0.09                                                                              | 0.39                                                                              | 0.77                                                                              | 0.77                                                                              | 0.00                                                                                | 0.38                                                                                | 0.38                                                                                |
| Sat Flow, veh/h             | 1453                                                                              | 71                                                                                | 1583                                                                              | 1368                                                                              | 173                                                                               | 141                                                                               | 1774                                                                              | 3593                                                                              | 33                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h        | 108                                                                               | 0                                                                                 | 0                                                                                 | 107                                                                               | 0                                                                                 | 0                                                                                 | 658                                                                               | 586                                                                               | 615                                                                               | 5                                                                                   | 1038                                                                                | 6                                                                                   |
| Grp Sat Flow(s),veh/h/ln    | 1524                                                                              | 0                                                                                 | 1583                                                                              | 1682                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                              | 1770                                                                              | 1857                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s             | 0.9                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 39.0                                                                              | 12.4                                                                              | 12.4                                                                              | 0.3                                                                                 | 27.9                                                                                | 0.3                                                                                 |
| Cycle Q Clear(g_c), s       | 7.2                                                                               | 0.0                                                                               | 0.0                                                                               | 6.3                                                                               | 0.0                                                                               | 0.0                                                                               | 39.0                                                                              | 12.4                                                                              | 12.4                                                                              | 0.3                                                                                 | 27.9                                                                                | 0.3                                                                                 |
| Prop In Lane                | 0.95                                                                              |                                                                                   | 1.00                                                                              | 0.81                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                              |                                                                                   | 0.02                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h      | 212                                                                               | 0                                                                                 | 138                                                                               | 223                                                                               | 0                                                                                 | 0                                                                                 | 696                                                                               | 1364                                                                              | 1431                                                                              | 7                                                                                   | 1354                                                                                | 606                                                                                 |
| V/C Ratio(X)                | 0.51                                                                              | 0.00                                                                              | 0.00                                                                              | 0.48                                                                              | 0.00                                                                              | 0.00                                                                              | 0.95                                                                              | 0.43                                                                              | 0.43                                                                              | 0.73                                                                                | 0.77                                                                                | 0.01                                                                                |
| Avail Cap(c_a), veh/h       | 475                                                                               | 0                                                                                 | 436                                                                               | 456                                                                               | 0                                                                                 | 0                                                                                 | 1157                                                                              | 1364                                                                              | 1431                                                                              | 1157                                                                                | 1853                                                                                | 829                                                                                 |
| HCM Platoon Ratio           | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)          | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh    | 48.1                                                                              | 0.0                                                                               | 0.0                                                                               | 47.8                                                                              | 0.0                                                                               | 0.0                                                                               | 32.0                                                                              | 4.3                                                                               | 4.3                                                                               | 54.2                                                                                | 29.4                                                                                | 20.8                                                                                |
| Incr Delay (d2), s/veh      | 1.9                                                                               | 0.0                                                                               | 0.0                                                                               | 1.6                                                                               | 0.0                                                                               | 0.0                                                                               | 7.2                                                                               | 0.5                                                                               | 0.4                                                                               | 42.1                                                                                | 2.3                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh   | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln    | 8.2                                                                               | 0.0                                                                               | 0.0                                                                               | 3.2                                                                               | 0.0                                                                               | 0.0                                                                               | 20.4                                                                              | 6.0                                                                               | 6.3                                                                               | 0.2                                                                                 | 14.0                                                                                | 0.1                                                                                 |
| LnGrp Delay(d),s/veh        | 50.0                                                                              | 0.0                                                                               | 0.0                                                                               | 49.4                                                                              | 0.0                                                                               | 0.0                                                                               | 39.2                                                                              | 4.7                                                                               | 4.7                                                                               | 96.2                                                                                | 31.6                                                                                | 20.8                                                                                |
| LnGrp LOS                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 | A                                                                                 | A                                                                                 | F                                                                                   | C                                                                                   | C                                                                                   |
| Approach Vol, veh/h         | 108                                                                               |                                                                                   | 107                                                                               |                                                                                   |                                                                                   |                                                                                   | 1859                                                                              |                                                                                   |                                                                                   | 1049                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh       | 50.0                                                                              |                                                                                   | 49.4                                                                              |                                                                                   |                                                                                   |                                                                                   | 16.9                                                                              |                                                                                   |                                                                                   | 31.9                                                                                |                                                                                     |                                                                                     |
| Approach LOS                | D                                                                                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | C                                                                                   |                                                                                     |                                                                                     |
| Timer                       | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s    | 46.7                                                                              | 47.6                                                                              |                                                                                   | 14.5                                                                              | 4.4                                                                               | 89.9                                                                              |                                                                                   | 14.5                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s     | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s | 71.0                                                                              | 57.0                                                                              |                                                                                   | 27.0                                                                              | 71.0                                                                              | 57.0                                                                              |                                                                                   | 30.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+M), s | 41.0                                                                              | 29.9                                                                              |                                                                                   | 8.3                                                                               | 2.3                                                                               | 14.4                                                                              |                                                                                   | 9.2                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s     | 1.7                                                                               | 11.7                                                                              |                                                                                   | 0.3                                                                               | 0.0                                                                               | 16.0                                                                              |                                                                                   | 0.3                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay         | 24.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 5: Honoapiilani Highway & Halawai Drive

10/05/2017

|                              | <div></div> |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                                           | EBT                                                                               | EBR                                                                               | WBL  | WBT                                                                               | WBR  | NBL                                                                               | NBT                                                                               | NBR  | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                               |  |  |      |  |      |  |  |      |  |  |  |
| Traffic Volume (veh/h)       | 55                                                                                            | 5                                                                                 | 140                                                                               | 15   | 0                                                                                 | 5    | 135                                                                               | 1645                                                                              | 10   | 10                                                                                  | 1630                                                                                | 60                                                                                  |
| Future Volume (veh/h)        | 55                                                                                            | 5                                                                                 | 140                                                                               | 15   | 0                                                                                 | 5    | 135                                                                               | 1645                                                                              | 10   | 10                                                                                  | 1630                                                                                | 60                                                                                  |
| Number                       | 3                                                                                             | 8                                                                                 | 18                                                                                | 7    | 4                                                                                 | 14   | 1                                                                                 | 6                                                                                 | 16   | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                             | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.97                                                                                          |                                                                                   | 0.96                                                                              | 0.97 |                                                                                   | 0.96 | 1.00                                                                              |                                                                                   | 1.00 | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                                          | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                                          | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 60                                                                                            | 5                                                                                 | 5                                                                                 | 16   | 0                                                                                 | 1    | 147                                                                               | 1788                                                                              | 11   | 11                                                                                  | 1772                                                                                | 40                                                                                  |
| Adj No. of Lanes             | 0                                                                                             | 1                                                                                 | 1                                                                                 | 0    | 1                                                                                 | 0    | 1                                                                                 | 2                                                                                 | 0    | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                                          | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                             | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 226                                                                                           | 16                                                                                | 173                                                                               | 175  | 2                                                                                 | 7    | 178                                                                               | 2666                                                                              | 16   | 14                                                                                  | 2289                                                                                | 1023                                                                                |
| Arrive On Green              | 0.12                                                                                          | 0.11                                                                              | 0.11                                                                              | 0.12 | 0.00                                                                              | 0.11 | 0.10                                                                              | 0.74                                                                              | 0.74 | 0.01                                                                                | 0.65                                                                                | 0.65                                                                                |
| Sat Flow, veh/h              | 1377                                                                                          | 140                                                                               | 1521                                                                              | 931  | 17                                                                                | 59   | 1774                                                                              | 3606                                                                              | 22   | 1774                                                                                | 3539                                                                                | 1582                                                                                |
| Grp Volume(v), veh/h         | 65                                                                                            | 0                                                                                 | 5                                                                                 | 17   | 0                                                                                 | 0    | 147                                                                               | 877                                                                               | 922  | 11                                                                                  | 1772                                                                                | 40                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1517                                                                                          | 0                                                                                 | 1521                                                                              | 1008 | 0                                                                                 | 0    | 1774                                                                              | 1770                                                                              | 1859 | 1774                                                                                | 1770                                                                                | 1582                                                                                |
| Q Serve(g_s), s              | 0.0                                                                                           | 0.0                                                                               | 0.3                                                                               | 1.0  | 0.0                                                                               | 0.0  | 8.2                                                                               | 25.8                                                                              | 25.9 | 0.6                                                                                 | 35.7                                                                                | 0.9                                                                                 |
| Cycle Q Clear(g_c), s        | 3.4                                                                                           | 0.0                                                                               | 0.3                                                                               | 4.4  | 0.0                                                                               | 0.0  | 8.2                                                                               | 25.8                                                                              | 25.9 | 0.6                                                                                 | 35.7                                                                                | 0.9                                                                                 |
| Prop In Lane                 | 0.92                                                                                          |                                                                                   | 1.00                                                                              | 0.94 |                                                                                   | 0.06 | 1.00                                                                              |                                                                                   | 0.01 | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 257                                                                                           | 0                                                                                 | 173                                                                               | 194  | 0                                                                                 | 0    | 178                                                                               | 1308                                                                              | 1374 | 14                                                                                  | 2289                                                                                | 1023                                                                                |
| V/C Ratio(X)                 | 0.25                                                                                          | 0.00                                                                              | 0.03                                                                              | 0.09 | 0.00                                                                              | 0.00 | 0.83                                                                              | 0.67                                                                              | 0.67 | 0.79                                                                                | 0.77                                                                                | 0.04                                                                                |
| Avail Cap(c_a), veh/h        | 416                                                                                           | 0                                                                                 | 347                                                                               | 350  | 0                                                                                 | 0    | 370                                                                               | 1509                                                                              | 1586 | 194                                                                                 | 2668                                                                                | 1193                                                                                |
| HCM Platoon Ratio            | 1.00                                                                                          | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                                          | 0.00                                                                              | 1.00                                                                              | 1.00 | 0.00                                                                              | 0.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 40.7                                                                                          | 0.0                                                                               | 39.7                                                                              | 42.2 | 0.0                                                                               | 0.0  | 44.5                                                                              | 6.8                                                                               | 6.8  | 49.9                                                                                | 12.6                                                                                | 6.4                                                                                 |
| Incr Delay (d2), s/veh       | 0.2                                                                                           | 0.0                                                                               | 0.0                                                                               | 0.1  | 0.0                                                                               | 0.0  | 3.7                                                                               | 1.5                                                                               | 1.5  | 29.0                                                                                | 1.7                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                                           | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.6                                                                                           | 0.0                                                                               | 0.1                                                                               | 0.4  | 0.0                                                                               | 0.0  | 4.2                                                                               | 13.0                                                                              | 13.6 | 0.4                                                                                 | 17.8                                                                                | 0.4                                                                                 |
| LnGrp Delay(d),s/veh         | 40.9                                                                                          | 0.0                                                                               | 39.7                                                                              | 42.2 | 0.0                                                                               | 0.0  | 48.2                                                                              | 8.3                                                                               | 8.3  | 79.0                                                                                | 14.3                                                                                | 6.5                                                                                 |
| LnGrp LOS                    | D                                                                                             |                                                                                   | D                                                                                 | D    |                                                                                   |      | D                                                                                 | A                                                                                 | A    | E                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 70                                                                                            |                                                                                   |                                                                                   |      |                                                                                   | 17   |                                                                                   | 1946                                                                              |      | 1823                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 40.8                                                                                          |                                                                                   |                                                                                   |      |                                                                                   | 42.2 |                                                                                   | 11.3                                                                              |      | 14.5                                                                                |                                                                                     |                                                                                     |
| Approach LOS                 | D                                                                                             |                                                                                   |                                                                                   |      |                                                                                   | D    |                                                                                   | B                                                                                 |      | B                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                             | 2                                                                                 | 3                                                                                 | 4    | 5                                                                                 | 6    | 7                                                                                 | 8                                                                                 |      |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                             | 2                                                                                 |                                                                                   |      | 4                                                                                 | 5    | 6                                                                                 | 8                                                                                 |      |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 14.1                                                                                          | 70.2                                                                              |                                                                                   |      | 16.5                                                                              | 4.8  | 79.5                                                                              | 16.5                                                                              |      |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                                           | 5.0                                                                               |                                                                                   |      | 5.0                                                                               | 4.0  | 5.0                                                                               | 5.0                                                                               |      |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 21.0                                                                                          | 76.0                                                                              |                                                                                   |      | 23.0                                                                              | 11.0 | 86.0                                                                              | 23.0                                                                              |      |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+10), s | 10.2                                                                                          | 37.7                                                                              |                                                                                   |      | 6.4                                                                               | 2.6  | 27.9                                                                              | 5.4                                                                               |      |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.1                                                                                           | 27.5                                                                              |                                                                                   |      | 0.0                                                                               | 0.0  | 36.1                                                                              | 0.1                                                                               |      |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                               |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          | 13.5                                                                                          |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 | B                                                                                             |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 6: Honoapiilani Highway & Kai Ala Drive/Puukolii Road

10/05/2017

|                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                              |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 85                                                                                | 5                                                                                 | 175                                                                               | 70                                                                                | 5                                                                                 | 50                                                                                | 125                                                                               | 1620                                                                              | 60                                                                                | 35                                                                                  | 1775                                                                                | 105                                                                                 |
| Future Volume (veh/h)        | 85                                                                                | 5                                                                                 | 175                                                                               | 70                                                                                | 5                                                                                 | 50                                                                                | 125                                                                               | 1620                                                                              | 60                                                                                | 35                                                                                  | 1775                                                                                | 105                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.99                                                                              | 0.99                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 92                                                                                | 5                                                                                 | 44                                                                                | 76                                                                                | 5                                                                                 | 2                                                                                 | 136                                                                               | 1761                                                                              | 48                                                                                | 38                                                                                  | 1929                                                                                | 91                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 1                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 222                                                                               | 10                                                                                | 216                                                                               | 138                                                                               | 174                                                                               | 70                                                                                | 157                                                                               | 2632                                                                              | 1177                                                                              | 49                                                                                  | 2415                                                                                | 1081                                                                                |
| Arrive On Green              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.09                                                                              | 0.74                                                                              | 0.74                                                                              | 0.03                                                                                | 0.68                                                                                | 0.68                                                                                |
| Sat Flow, veh/h              | 1300                                                                              | 71                                                                                | 1563                                                                              | 1338                                                                              | 1261                                                                              | 505                                                                               | 1774                                                                              | 3539                                                                              | 1582                                                                              | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 97                                                                                | 0                                                                                 | 44                                                                                | 76                                                                                | 0                                                                                 | 7                                                                                 | 136                                                                               | 1761                                                                              | 48                                                                                | 38                                                                                  | 1929                                                                                | 91                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1371                                                                              | 0                                                                                 | 1563                                                                              | 1338                                                                              | 0                                                                                 | 1766                                                                              | 1774                                                                              | 1770                                                                              | 1582                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 10.5                                                                              | 0.0                                                                               | 4.1                                                                               | 9.2                                                                               | 0.0                                                                               | 0.6                                                                               | 12.5                                                                              | 41.9                                                                              | 1.3                                                                               | 3.5                                                                                 | 62.8                                                                                | 3.2                                                                                 |
| Cycle Q Clear(g_c), s        | 11.1                                                                              | 0.0                                                                               | 4.1                                                                               | 20.3                                                                              | 0.0                                                                               | 0.6                                                                               | 12.5                                                                              | 41.9                                                                              | 1.3                                                                               | 3.5                                                                                 | 62.8                                                                                | 3.2                                                                                 |
| Prop In Lane                 | 0.95                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.29                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 240                                                                               | 0                                                                                 | 216                                                                               | 138                                                                               | 0                                                                                 | 244                                                                               | 157                                                                               | 2632                                                                              | 1177                                                                              | 49                                                                                  | 2415                                                                                | 1081                                                                                |
| V/C Ratio(X)                 | 0.40                                                                              | 0.00                                                                              | 0.20                                                                              | 0.55                                                                              | 0.00                                                                              | 0.03                                                                              | 0.86                                                                              | 0.67                                                                              | 0.04                                                                              | 0.78                                                                                | 0.80                                                                                | 0.08                                                                                |
| Avail Cap(c_a), veh/h        | 250                                                                               | 0                                                                                 | 227                                                                               | 148                                                                               | 0                                                                                 | 257                                                                               | 280                                                                               | 2632                                                                              | 1177                                                                              | 108                                                                                 | 2415                                                                                | 1081                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.62                                                                              | 0.62                                                                              | 0.62                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 65.9                                                                              | 0.0                                                                               | 63.1                                                                              | 75.5                                                                              | 0.0                                                                               | 61.6                                                                              | 74.2                                                                              | 10.8                                                                              | 5.6                                                                               | 79.7                                                                                | 18.3                                                                                | 8.8                                                                                 |
| Incr Delay (d2), s/veh       | 1.1                                                                               | 0.0                                                                               | 0.5                                                                               | 3.7                                                                               | 0.0                                                                               | 0.0                                                                               | 3.4                                                                               | 0.9                                                                               | 0.0                                                                               | 9.3                                                                                 | 2.9                                                                                 | 0.2                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 4.1                                                                               | 0.0                                                                               | 1.8                                                                               | 3.6                                                                               | 0.0                                                                               | 0.3                                                                               | 6.3                                                                               | 20.6                                                                              | 0.6                                                                               | 1.8                                                                                 | 31.2                                                                                | 1.4                                                                                 |
| LnGrp Delay(d),s/veh         | 67.0                                                                              | 0.0                                                                               | 63.6                                                                              | 79.2                                                                              | 0.0                                                                               | 61.6                                                                              | 77.6                                                                              | 11.7                                                                              | 5.6                                                                               | 89.0                                                                                | 21.1                                                                                | 9.0                                                                                 |
| LnGrp LOS                    | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                 | B                                                                                 | A                                                                                 | F                                                                                   | C                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 141                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 83                                                                                |                                                                                   | 1945                                                                              |                                                                                   | 2058                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 65.9                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 77.7                                                                              |                                                                                   | 16.1                                                                              |                                                                                   | 21.9                                                                                |                                                                                     |                                                                                     |
| Approach LOS                 | E                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   | E                                                                                 |                                                                                   | B                                                                                 |                                                                                   | C                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 4                                                                                 |                                                                                   | 5                                                                                 | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 18.6                                                                              | 118.6                                                                             | 27.8                                                                              |                                                                                   | 8.6                                                                               | 128.7                                                                             | 27.8                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 6.0                                                                               | 5.0                                                                               |                                                                                   | 4.0                                                                               | 6.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 26.0                                                                              | 100.0                                                                             | 24.0                                                                              |                                                                                   | 10.0                                                                              | 116.0                                                                             | 24.0                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+14), s | 14.5                                                                              | 64.8                                                                              | 22.3                                                                              |                                                                                   | 5.5                                                                               | 43.9                                                                              | 13.1                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.2                                                                               | 28.4                                                                              | 0.0                                                                               |                                                                                   | 0.0                                                                               | 41.1                                                                              | 0.3                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 21.8                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 7: Honoapiilani Highway & Kaanapali Parkway/Halelo Street

10/05/2017

|                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|--------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                       | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations            |  |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)         | 325                                                                               | 5                                                                                 | 615                                                                               | 15                                                                                | 0                                                                                 | 5                                                                                 | 385                                                                               | 1630                                                                              | 10                                                                                | 80                                                                                  | 1795                                                                                | 140                                                                                 |
| Future Volume (veh/h)          | 325                                                                               | 5                                                                                 | 615                                                                               | 15                                                                                | 0                                                                                 | 5                                                                                 | 385                                                                               | 1630                                                                              | 10                                                                                | 80                                                                                  | 1795                                                                                | 140                                                                                 |
| Number                         | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)            | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 0.96                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln         | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h           | 357                                                                               | 0                                                                                 | 465                                                                               | 16                                                                                | 0                                                                                 | 1                                                                                 | 418                                                                               | 1772                                                                              | 11                                                                                | 87                                                                                  | 1951                                                                                | 131                                                                                 |
| Adj No. of Lanes               | 2                                                                                 | 0                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 2                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor               | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %           | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                     | 519                                                                               | 0                                                                                 | 889                                                                               | 67                                                                                | 0                                                                                 | 4                                                                                 | 485                                                                               | 2453                                                                              | 15                                                                                | 114                                                                                 | 2137                                                                                | 1181                                                                                |
| Arrive On Green                | 0.15                                                                              | 0.00                                                                              | 0.14                                                                              | 0.04                                                                              | 0.00                                                                              | 0.03                                                                              | 0.14                                                                              | 0.68                                                                              | 0.67                                                                              | 0.06                                                                                | 0.60                                                                                | 0.60                                                                                |
| Sat Flow, veh/h                | 3548                                                                              | 0                                                                                 | 3122                                                                              | 1653                                                                              | 0                                                                                 | 103                                                                               | 3442                                                                              | 3606                                                                              | 22                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h           | 357                                                                               | 0                                                                                 | 465                                                                               | 17                                                                                | 0                                                                                 | 0                                                                                 | 418                                                                               | 869                                                                               | 914                                                                               | 87                                                                                  | 1951                                                                                | 131                                                                                 |
| Grp Sat Flow(s),veh/h/ln       | 1774                                                                              | 0                                                                                 | 1561                                                                              | 1756                                                                              | 0                                                                                 | 0                                                                                 | 1721                                                                              | 1770                                                                              | 1859                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s                | 22.2                                                                              | 0.0                                                                               | 29.2                                                                              | 2.2                                                                               | 0.0                                                                               | 0.0                                                                               | 27.6                                                                              | 71.8                                                                              | 72.0                                                                              | 11.2                                                                                | 113.2                                                                               | 5.3                                                                                 |
| Cycle Q Clear(g_c), s          | 22.2                                                                              | 0.0                                                                               | 29.2                                                                              | 2.2                                                                               | 0.0                                                                               | 0.0                                                                               | 27.6                                                                              | 71.8                                                                              | 72.0                                                                              | 11.2                                                                                | 113.2                                                                               | 5.3                                                                                 |
| Prop In Lane                   | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.94                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                              |                                                                                   | 0.01                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h         | 519                                                                               | 0                                                                                 | 889                                                                               | 71                                                                                | 0                                                                                 | 0                                                                                 | 485                                                                               | 1204                                                                              | 1264                                                                              | 114                                                                                 | 2137                                                                                | 1181                                                                                |
| V/C Ratio(X)                   | 0.69                                                                              | 0.00                                                                              | 0.52                                                                              | 0.24                                                                              | 0.00                                                                              | 0.00                                                                              | 0.86                                                                              | 0.72                                                                              | 0.72                                                                              | 0.76                                                                                | 0.91                                                                                | 0.11                                                                                |
| Avail Cap(c_a), veh/h          | 519                                                                               | 0                                                                                 | 889                                                                               | 234                                                                               | 0                                                                                 | 0                                                                                 | 858                                                                               | 1476                                                                              | 1550                                                                              | 114                                                                                 | 2297                                                                                | 1252                                                                                |
| HCM Platoon Ratio              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)             | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh       | 94.3                                                                              | 0.0                                                                               | 70.3                                                                              | 108.3                                                                             | 0.0                                                                               | 0.0                                                                               | 97.7                                                                              | 23.4                                                                              | 23.4                                                                              | 107.1                                                                               | 40.7                                                                                | 8.2                                                                                 |
| Incr Delay (d2), s/veh         | 3.2                                                                               | 0.0                                                                               | 0.3                                                                               | 0.6                                                                               | 0.0                                                                               | 0.0                                                                               | 1.8                                                                               | 1.6                                                                               | 1.6                                                                               | 23.0                                                                                | 6.0                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh      | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln       | 11.1                                                                              | 0.0                                                                               | 12.7                                                                              | 1.1                                                                               | 0.0                                                                               | 0.0                                                                               | 13.3                                                                              | 35.6                                                                              | 37.4                                                                              | 6.2                                                                                 | 57.1                                                                                | 3.7                                                                                 |
| LnGrp Delay(d),s/veh           | 97.5                                                                              | 0.0                                                                               | 70.6                                                                              | 108.9                                                                             | 0.0                                                                               | 0.0                                                                               | 99.6                                                                              | 25.0                                                                              | 25.0                                                                              | 130.1                                                                               | 46.7                                                                                | 8.3                                                                                 |
| LnGrp LOS                      | F                                                                                 |                                                                                   | E                                                                                 | F                                                                                 |                                                                                   |                                                                                   | F                                                                                 | C                                                                                 | C                                                                                 | F                                                                                   | D                                                                                   | A                                                                                   |
| Approach Vol, veh/h            | 822                                                                               |                                                                                   | 17                                                                                |                                                                                   |                                                                                   |                                                                                   | 2201                                                                              |                                                                                   |                                                                                   | 2169                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh          | 82.3                                                                              |                                                                                   | 108.9                                                                             |                                                                                   |                                                                                   |                                                                                   | 39.2                                                                              |                                                                                   |                                                                                   | 47.7                                                                                |                                                                                     |                                                                                     |
| Approach LOS                   | F                                                                                 |                                                                                   | F                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                   |                                                                                     |                                                                                     |
| Timer                          | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                   | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s       | 36.8                                                                              | 144.5                                                                             |                                                                                   | 13.4                                                                              | 19.0                                                                              | 162.3                                                                             |                                                                                   | 38.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s        | 6.0                                                                               | 6.0                                                                               |                                                                                   | 7.0                                                                               | 6.0                                                                               | 6.0                                                                               |                                                                                   | 7.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s    | 50.0                                                                              | 149.0                                                                             |                                                                                   | 28.0                                                                              | 13.0                                                                              | 192.0                                                                             |                                                                                   | 31.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+29.6), s | 29.6                                                                              | 115.2                                                                             |                                                                                   | 4.2                                                                               | 13.2                                                                              | 74.0                                                                              |                                                                                   | 31.2                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s        | 1.1                                                                               | 23.3                                                                              |                                                                                   | 0.0                                                                               | 0.0                                                                               | 28.2                                                                              |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay            | 49.8                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 8: Honoapiilani Highway & Leialii Parkway

10/05/2017

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------|
|                              | <div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div> |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| Movement                     | EBL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | EBT                                                                               | EBR  | WBL                                                                               | WBT                                                                               | WBR  | NBL                                                                               | NBT                                                                               | NBR  | SBL                                                                                 | SBT                                                                                 | SBR  |
| Lane Configurations          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |      |  |  |      |  |  |      |  |  |      |
| Traffic Volume (veh/h)       | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0                                                                                 | 5    | 90                                                                                | 5                                                                                 | 65   | 10                                                                                | 1960                                                                              | 90   | 90                                                                                  | 2350                                                                                | 5    |
| Future Volume (veh/h)        | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0                                                                                 | 5    | 90                                                                                | 5                                                                                 | 65   | 10                                                                                | 1960                                                                              | 90   | 90                                                                                  | 2350                                                                                | 5    |
| Number                       | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 8                                                                                 | 18   | 7                                                                                 | 4                                                                                 | 14   | 1                                                                                 | 6                                                                                 | 16   | 5                                                                                   | 2                                                                                   | 12   |
| Initial Q (Qb), veh          | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   | 0                                                                                   | 0    |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                   | 1.00 | 1.00                                                                              |                                                                                   | 1.00 | 1.00                                                                              |                                                                                   | 1.00 | 1.00                                                                                |                                                                                     | 1.00 |
| Parking Bus, Adj             | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00 |
| Adj Sat Flow, veh/h/ln       | 1900                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                                | 1863                                                                                | 1900 |
| Adj Flow Rate, veh/h         | 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0                                                                                 | 1    | 98                                                                                | 5                                                                                 | 3    | 11                                                                                | 2130                                                                              | 96   | 98                                                                                  | 2554                                                                                | 5    |
| Adj No. of Lanes             | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1                                                                                 | 0    | 1                                                                                 | 1                                                                                 | 0    | 1                                                                                 | 2                                                                                 | 0    | 1                                                                                   | 2                                                                                   | 0    |
| Peak Hour Factor             | 0.92                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                                | 0.92                                                                                | 0.92 |
| Percent Heavy Veh, %         | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                   | 2                                                                                   | 2    |
| Cap, veh/h                   | 155                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2                                                                                 | 10   | 176                                                                               | 95                                                                                | 57   | 22                                                                                | 2628                                                                              | 118  | 122                                                                                 | 2964                                                                                | 6    |
| Arrive On Green              | 0.09                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.00                                                                              | 0.08 | 0.09                                                                              | 0.09                                                                              | 0.08 | 0.02                                                                              | 1.00                                                                              | 1.00 | 0.07                                                                                | 0.82                                                                                | 0.81 |
| Sat Flow, veh/h              | 1234                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 24                                                                                | 114  | 1410                                                                              | 1092                                                                              | 655  | 1774                                                                              | 3451                                                                              | 154  | 1774                                                                                | 3624                                                                                | 7    |
| Grp Volume(v), veh/h         | 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0                                                                                 | 0    | 98                                                                                | 0                                                                                 | 8    | 11                                                                                | 1084                                                                              | 1142 | 98                                                                                  | 1247                                                                                | 1312 |
| Grp Sat Flow(s),veh/h/ln     | 1373                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0                                                                                 | 0    | 1410                                                                              | 0                                                                                 | 1747 | 1774                                                                              | 1770                                                                              | 1836 | 1774                                                                                | 1770                                                                                | 1861 |
| Q Serve(g_s), s              | 0.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.0                                                                               | 0.0  | 8.0                                                                               | 0.0                                                                               | 0.6  | 0.9                                                                               | 0.0                                                                               | 0.0  | 7.9                                                                                 | 62.9                                                                                | 63.1 |
| Cycle Q Clear(g_c), s        | 1.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.0                                                                               | 0.0  | 9.5                                                                               | 0.0                                                                               | 0.6  | 0.9                                                                               | 0.0                                                                               | 0.0  | 7.9                                                                                 | 62.9                                                                                | 63.1 |
| Prop In Lane                 | 0.92                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                   | 0.08 | 1.00                                                                              |                                                                                   | 0.38 | 1.00                                                                              |                                                                                   | 0.08 | 1.00                                                                                |                                                                                     | 0.00 |
| Lane Grp Cap(c), veh/h       | 167                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0                                                                                 | 0    | 176                                                                               | 0                                                                                 | 152  | 22                                                                                | 1348                                                                              | 1398 | 122                                                                                 | 1448                                                                                | 1523 |
| V/C Ratio(X)                 | 0.07                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.00                                                                              | 0.00 | 0.56                                                                              | 0.00                                                                              | 0.05 | 0.50                                                                              | 0.80                                                                              | 0.82 | 0.80                                                                                | 0.86                                                                                | 0.86 |
| Avail Cap(c_a), veh/h        | 278                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0                                                                                 | 0    | 287                                                                               | 0                                                                                 | 289  | 61                                                                                | 1348                                                                              | 1398 | 184                                                                                 | 1448                                                                                | 1523 |
| HCM Platoon Ratio            | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 2.00                                                                              | 2.00                                                                              | 2.00 | 1.00                                                                                | 1.00                                                                                | 1.00 |
| Upstream Filter(I)           | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.00                                                                              | 0.00 | 1.00                                                                              | 0.00                                                                              | 1.00 | 0.52                                                                              | 0.52                                                                              | 0.52 | 1.00                                                                                | 1.00                                                                                | 1.00 |
| Uniform Delay (d), s/veh     | 61.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.0                                                                               | 0.0  | 64.6                                                                              | 0.0                                                                               | 60.9 | 70.3                                                                              | 0.0                                                                               | 0.0  | 66.6                                                                                | 8.1                                                                                 | 8.1  |
| Incr Delay (d2), s/veh       | 0.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.0                                                                               | 0.0  | 2.7                                                                               | 0.0                                                                               | 0.1  | 3.4                                                                               | 2.8                                                                               | 2.9  | 8.0                                                                                 | 6.9                                                                                 | 6.7  |
| Initial Q Delay(d3),s/veh    | 0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                                 | 0.0                                                                                 | 0.0  |
| %ile BackOfQ(50%),veh/ln     | 0.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.0                                                                               | 0.0  | 4.0                                                                               | 0.0                                                                               | 0.3  | 0.5                                                                               | 1.0                                                                               | 1.1  | 4.1                                                                                 | 32.6                                                                                | 34.5 |
| LnGrp Delay(d),s/veh         | 61.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.0                                                                               | 0.0  | 67.4                                                                              | 0.0                                                                               | 61.0 | 73.7                                                                              | 2.8                                                                               | 2.9  | 74.5                                                                                | 15.1                                                                                | 14.8 |
| LnGrp LOS                    | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                   |      | E                                                                                 |                                                                                   | E    | E                                                                                 | A                                                                                 | A    | E                                                                                   | B                                                                                   | B    |
| Approach Vol, veh/h          | 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                   |      |                                                                                   | 106                                                                               |      | 2237                                                                              |                                                                                   |      |                                                                                     | 2657                                                                                |      |
| Approach Delay, s/veh        | 61.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                   |      |                                                                                   | 66.9                                                                              |      | 3.2                                                                               |                                                                                   |      |                                                                                     | 17.1                                                                                |      |
| Approach LOS                 | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                   |      |                                                                                   | E                                                                                 |      | A                                                                                 |                                                                                   |      |                                                                                     | B                                                                                   |      |
| Timer                        | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2                                                                                 | 3    | 4                                                                                 | 5                                                                                 | 6    | 7                                                                                 | 8                                                                                 |      |                                                                                     |                                                                                     |      |
| Assigned Phs                 | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2                                                                                 |      |                                                                                   | 4                                                                                 | 5    | 6                                                                                 | 8                                                                                 |      |                                                                                     |                                                                                     |      |
| Phs Duration (G+Y+Rc), s     | 5.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 122.6                                                                             |      |                                                                                   | 16.6                                                                              | 14.0 | 114.4                                                                             | 16.6                                                                              |      |                                                                                     |                                                                                     |      |
| Change Period (Y+Rc), s      | 4.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 5.0                                                                               |      |                                                                                   | 5.0                                                                               | 4.0  | 5.0                                                                               | 5.0                                                                               |      |                                                                                     |                                                                                     |      |
| Max Green Setting (Gmax), s  | 5.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 103.0                                                                             |      |                                                                                   | 23.0                                                                              | 15.0 | 93.0                                                                              | 23.0                                                                              |      |                                                                                     |                                                                                     |      |
| Max Q Clear Time (g_c+12, s) | 12.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 65.1                                                                              |      |                                                                                   | 11.5                                                                              | 9.9  | 2.0                                                                               | 3.5                                                                               |      |                                                                                     |                                                                                     |      |
| Green Ext Time (p_c), s      | 0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 36.4                                                                              |      |                                                                                   | 0.2                                                                               | 0.1  | 70.0                                                                              | 0.0                                                                               |      |                                                                                     |                                                                                     |      |
| Intersection Summary         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| HCM 2010 Ctrl Delay          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                   | 12.1 |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| HCM 2010 LOS                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                   | B    |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |

# HCM 2010 Signalized Intersection Summary

## 9: Honoapiilani Highway & Front Street/Flemming Road

10/05/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                   |  |                                                                                   |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)        | 190                                                                               | 15                                                                                | 10                                                                                | 60                                                                                | 5                                                                                 | 10                                                                                | 5                                                                                 | 1870                                                                              | 20                                                                                | 5                                                                                   | 1990                                                                                | 340                                                                                 |
| Future Volume (veh/h)         | 190                                                                               | 15                                                                                | 10                                                                                | 60                                                                                | 5                                                                                 | 10                                                                                | 5                                                                                 | 1870                                                                              | 20                                                                                | 5                                                                                   | 1990                                                                                | 340                                                                                 |
| Number                        | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 207                                                                               | 16                                                                                | 9                                                                                 | 65                                                                                | 5                                                                                 | 7                                                                                 | 5                                                                                 | 2033                                                                              | 21                                                                                | 5                                                                                   | 2163                                                                                | 290                                                                                 |
| Adj No. of Lanes              | 0                                                                                 | 1                                                                                 | 0                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 279                                                                               | 18                                                                                | 10                                                                                | 287                                                                               | 23                                                                                | 26                                                                                | 7                                                                                 | 2649                                                                              | 27                                                                                | 7                                                                                   | 2612                                                                                | 1169                                                                                |
| Arrive On Green               | 0.18                                                                              | 0.18                                                                              | 0.17                                                                              | 0.18                                                                              | 0.18                                                                              | 0.17                                                                              | 0.01                                                                              | 0.98                                                                              | 0.97                                                                              | 0.00                                                                                | 0.74                                                                                | 0.74                                                                                |
| Sat Flow, veh/h               | 1324                                                                              | 102                                                                               | 58                                                                                | 1375                                                                              | 130                                                                               | 151                                                                               | 1774                                                                              | 3589                                                                              | 37                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h          | 232                                                                               | 0                                                                                 | 0                                                                                 | 77                                                                                | 0                                                                                 | 0                                                                                 | 5                                                                                 | 1001                                                                              | 1053                                                                              | 5                                                                                   | 2163                                                                                | 290                                                                                 |
| Grp Sat Flow(s),veh/h/ln      | 1484                                                                              | 0                                                                                 | 0                                                                                 | 1656                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                              | 1770                                                                              | 1856                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s               | 16.3                                                                              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 6.1                                                                               | 6.2                                                                               | 0.4                                                                                 | 59.7                                                                                | 8.5                                                                                 |
| Cycle Q Clear(g_c), s         | 22.0                                                                              | 0.0                                                                               | 0.0                                                                               | 5.7                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 6.1                                                                               | 6.2                                                                               | 0.4                                                                                 | 59.7                                                                                | 8.5                                                                                 |
| Prop In Lane                  | 0.89                                                                              |                                                                                   | 0.04                                                                              | 0.84                                                                              |                                                                                   | 0.09                                                                              | 1.00                                                                              |                                                                                   | 0.02                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 307                                                                               | 0                                                                                 | 0                                                                                 | 336                                                                               | 0                                                                                 | 0                                                                                 | 7                                                                                 | 1306                                                                              | 1370                                                                              | 7                                                                                   | 2612                                                                                | 1169                                                                                |
| V/C Ratio(X)                  | 0.75                                                                              | 0.00                                                                              | 0.00                                                                              | 0.23                                                                              | 0.00                                                                              | 0.00                                                                              | 0.75                                                                              | 0.77                                                                              | 0.77                                                                              | 0.75                                                                                | 0.83                                                                                | 0.25                                                                                |
| Avail Cap(c_a), veh/h         | 362                                                                               | 0                                                                                 | 0                                                                                 | 391                                                                               | 0                                                                                 | 0                                                                                 | 37                                                                                | 1306                                                                              | 1370                                                                              | 37                                                                                  | 2612                                                                                | 1169                                                                                |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.33                                                                              | 1.33                                                                              | 1.33                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.52                                                                              | 0.52                                                                              | 0.52                                                                              | 0.34                                                                                | 0.34                                                                                | 0.34                                                                                |
| Uniform Delay (d), s/veh      | 58.0                                                                              | 0.0                                                                               | 0.0                                                                               | 51.7                                                                              | 0.0                                                                               | 0.0                                                                               | 72.1                                                                              | 0.4                                                                               | 0.4                                                                               | 72.2                                                                                | 12.8                                                                                | 6.1                                                                                 |
| Incr Delay (d2), s/veh        | 7.4                                                                               | 0.0                                                                               | 0.0                                                                               | 0.3                                                                               | 0.0                                                                               | 0.0                                                                               | 26.7                                                                              | 2.3                                                                               | 2.2                                                                               | 18.6                                                                                | 1.1                                                                                 | 0.2                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 9.7                                                                               | 0.0                                                                               | 0.0                                                                               | 2.7                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                               | 2.7                                                                               | 2.8                                                                               | 0.2                                                                                 | 29.2                                                                                | 3.8                                                                                 |
| LnGrp Delay(d),s/veh          | 65.4                                                                              | 0.0                                                                               | 0.0                                                                               | 52.0                                                                              | 0.0                                                                               | 0.0                                                                               | 98.7                                                                              | 2.7                                                                               | 2.6                                                                               | 90.8                                                                                | 13.9                                                                                | 6.3                                                                                 |
| LnGrp LOS                     | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | F                                                                                 | A                                                                                 | A                                                                                 | F                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h           | 232                                                                               |                                                                                   |                                                                                   |                                                                                   | 77                                                                                |                                                                                   | 2059                                                                              |                                                                                   |                                                                                   |                                                                                     | 2458                                                                                |                                                                                     |
| Approach Delay, s/veh         | 65.4                                                                              |                                                                                   |                                                                                   |                                                                                   | 52.0                                                                              |                                                                                   | 2.9                                                                               |                                                                                   |                                                                                   |                                                                                     | 13.2                                                                                |                                                                                     |
| Approach LOS                  | E                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 |                                                                                   |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 4.5                                                                               | 111.0                                                                             |                                                                                   |                                                                                   | 29.4                                                                              | 4.5                                                                               | 111.0                                                                             | 29.4                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 3.0                                                                               | 98.0                                                                              |                                                                                   |                                                                                   | 30.0                                                                              | 3.0                                                                               | 98.0                                                                              | 30.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1/4), s | 12.4                                                                              | 61.7                                                                              |                                                                                   |                                                                                   | 7.7                                                                               | 2.4                                                                               | 8.2                                                                               | 24.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.0                                                                               | 34.7                                                                              |                                                                                   |                                                                                   | 0.2                                                                               | 0.0                                                                               | 74.1                                                                              | 0.4                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           |                                                                                   |                                                                                   | 11.9                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 10: Honoapiilani Highway & Kapunakea Street

10/05/2017



| Movement                     | EBL  | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR   | NBL                                                                               | NBT                                                                               | NBR  | SBL                                                                               | SBT                                                                               | SBR  |
|------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|
| Lane Configurations          |      |  |  |  |  |       |  |  |      |  |  |      |
| Traffic Volume (veh/h)       | 190  | 35                                                                                | 45                                                                                | 95                                                                                | 25                                                                                | 20    | 55                                                                                | 1660                                                                              | 105  | 30                                                                                | 1920                                                                              | 160  |
| Future Volume (veh/h)        | 190  | 35                                                                                | 45                                                                                | 95                                                                                | 25                                                                                | 20    | 55                                                                                | 1660                                                                              | 105  | 30                                                                                | 1920                                                                              | 160  |
| Number                       | 3    | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14    | 1                                                                                 | 6                                                                                 | 16   | 5                                                                                 | 2                                                                                 | 12   |
| Initial Q (Qb), veh          | 0    | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0     | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    |
| Ped-Bike Adj(A_pbT)          | 0.98 |                                                                                   | 0.98                                                                              | 0.99                                                                              |                                                                                   | 0.98  | 1.00                                                                              |                                                                                   | 1.00 | 1.00                                                                              |                                                                                   | 1.00 |
| Parking Bus, Adj             | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00  | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 |
| Adj Sat Flow, veh/h/ln       | 1900 | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900  | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1900 |
| Adj Flow Rate, veh/h         | 207  | 38                                                                                | 10                                                                                | 103                                                                               | 27                                                                                | 2     | 60                                                                                | 1804                                                                              | 111  | 33                                                                                | 2087                                                                              | 170  |
| Adj No. of Lanes             | 0    | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0     | 1                                                                                 | 2                                                                                 | 0    | 1                                                                                 | 2                                                                                 | 0    |
| Peak Hour Factor             | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92  | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92 |
| Percent Heavy Veh, %         | 2    | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2     | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    |
| Cap, veh/h                   | 268  | 41                                                                                | 309                                                                               | 357                                                                               | 342                                                                               | 25    | 73                                                                                | 2350                                                                              | 143  | 42                                                                                | 2242                                                                              | 180  |
| Arrive On Green              | 0.20 | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.19  | 0.08                                                                              | 1.00                                                                              | 1.00 | 0.05                                                                              | 1.00                                                                              | 1.00 |
| Sat Flow, veh/h              | 1111 | 204                                                                               | 1545                                                                              | 1347                                                                              | 1710                                                                              | 127   | 1774                                                                              | 3389                                                                              | 207  | 1774                                                                              | 3318                                                                              | 267  |
| Grp Volume(v), veh/h         | 245  | 0                                                                                 | 10                                                                                | 103                                                                               | 0                                                                                 | 29    | 60                                                                                | 934                                                                               | 981  | 33                                                                                | 1100                                                                              | 1157 |
| Grp Sat Flow(s),veh/h/ln     | 1315 | 0                                                                                 | 1545                                                                              | 1347                                                                              | 0                                                                                 | 1837  | 1774                                                                              | 1770                                                                              | 1826 | 1774                                                                              | 1770                                                                              | 1815 |
| Q Serve(g_s), s              | 24.9 | 0.0                                                                               | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 1.9   | 4.8                                                                               | 0.0                                                                               | 0.0  | 2.7                                                                               | 0.0                                                                               | 0.0  |
| Cycle Q Clear(g_c), s        | 26.7 | 0.0                                                                               | 0.8                                                                               | 8.2                                                                               | 0.0                                                                               | 1.9   | 4.8                                                                               | 0.0                                                                               | 0.0  | 2.7                                                                               | 0.0                                                                               | 0.0  |
| Prop In Lane                 | 0.84 |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.07  | 1.00                                                                              |                                                                                   | 0.11 | 1.00                                                                              |                                                                                   | 0.15 |
| Lane Grp Cap(c), veh/h       | 309  | 0                                                                                 | 309                                                                               | 357                                                                               | 0                                                                                 | 367   | 73                                                                                | 1227                                                                              | 1266 | 42                                                                                | 1196                                                                              | 1227 |
| V/C Ratio(X)                 | 0.79 | 0.00                                                                              | 0.03                                                                              | 0.29                                                                              | 0.00                                                                              | 0.08  | 0.82                                                                              | 0.76                                                                              | 0.77 | 0.79                                                                              | 0.92                                                                              | 0.94 |
| Avail Cap(c_a), veh/h        | 309  | 0                                                                                 | 309                                                                               | 357                                                                               | 0                                                                                 | 367   | 73                                                                                | 1227                                                                              | 1266 | 73                                                                                | 1196                                                                              | 1227 |
| HCM Platoon Ratio            | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00  | 2.00                                                                              | 2.00                                                                              | 2.00 | 2.00                                                                              | 2.00                                                                              | 2.00 |
| Upstream Filter(I)           | 1.00 | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00  | 0.21                                                                              | 0.21                                                                              | 0.21 | 0.45                                                                              | 0.45                                                                              | 0.45 |
| Uniform Delay (d), s/veh     | 58.0 | 0.0                                                                               | 46.7                                                                              | 49.7                                                                              | 0.0                                                                               | 47.2  | 66.0                                                                              | 0.0                                                                               | 0.0  | 68.7                                                                              | 0.0                                                                               | 0.0  |
| Incr Delay (d2), s/veh       | 13.2 | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.1   | 13.4                                                                              | 1.0                                                                               | 1.0  | 5.3                                                                               | 6.5                                                                               | 8.3  |
| Initial Q Delay(d3),s/veh    | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0   | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0  |
| %ile BackOfQ(50%),veh/ln     | 10.8 | 0.0                                                                               | 0.3                                                                               | 3.6                                                                               | 0.0                                                                               | 1.0   | 2.6                                                                               | 0.3                                                                               | 0.4  | 1.4                                                                               | 2.2                                                                               | 2.8  |
| LnGrp Delay(d),s/veh         | 71.2 | 0.0                                                                               | 46.7                                                                              | 50.1                                                                              | 0.0                                                                               | 47.3  | 79.4                                                                              | 1.0                                                                               | 1.0  | 74.0                                                                              | 6.5                                                                               | 8.3  |
| LnGrp LOS                    | E    |                                                                                   | D                                                                                 | D                                                                                 |                                                                                   | D     | E                                                                                 | A                                                                                 | A    | E                                                                                 | A                                                                                 | A    |
| Approach Vol, veh/h          | 255  |                                                                                   | 132                                                                               |                                                                                   |                                                                                   | 1975  |                                                                                   |                                                                                   | 2290 |                                                                                   |                                                                                   |      |
| Approach Delay, s/veh        | 70.3 |                                                                                   | 49.5                                                                              |                                                                                   |                                                                                   | 3.4   |                                                                                   |                                                                                   | 8.4  |                                                                                   |                                                                                   |      |
| Approach LOS                 | E    |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | A     |                                                                                   |                                                                                   | A    |                                                                                   |                                                                                   |      |
| Timer                        | 1    | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6     | 7                                                                                 | 8                                                                                 |      |                                                                                   |                                                                                   |      |
| Assigned Phs                 | 1    | 2                                                                                 | 4                                                                                 |                                                                                   | 5                                                                                 | 6     | 8                                                                                 |                                                                                   |      |                                                                                   |                                                                                   |      |
| Phs Duration (G+Y+Rc), s     | 10.0 | 102.0                                                                             | 33.0                                                                              |                                                                                   | 7.4                                                                               | 104.6 | 33.0                                                                              |                                                                                   |      |                                                                                   |                                                                                   |      |
| Change Period (Y+Rc), s      | 4.0  | 5.0                                                                               | 5.0                                                                               |                                                                                   | 4.0                                                                               | 5.0   | 5.0                                                                               |                                                                                   |      |                                                                                   |                                                                                   |      |
| Max Green Setting (Gmax), s  | 97.0 | 97.0                                                                              | 28.0                                                                              |                                                                                   | 6.0                                                                               | 97.0  | 28.0                                                                              |                                                                                   |      |                                                                                   |                                                                                   |      |
| Max Q Clear Time (g_c+10), s | 10.8 | 2.0                                                                               | 10.2                                                                              |                                                                                   | 4.7                                                                               | 2.0   | 28.7                                                                              |                                                                                   |      |                                                                                   |                                                                                   |      |
| Green Ext Time (p_c), s      | 0.0  | 72.1                                                                              | 0.4                                                                               |                                                                                   | 0.0                                                                               | 51.7  | 0.0                                                                               |                                                                                   |      |                                                                                   |                                                                                   |      |
| Intersection Summary         |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |
| HCM 2010 Ctrl Delay          |      |                                                                                   | 10.8                                                                              |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |
| HCM 2010 LOS                 |      |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |
| Notes                        |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |

# HCM 2010 Signalized Intersection Summary

## 11: Honoapiilani Highway & Keawe Street

10/05/2017

|                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                              |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 65                                                                                | 185                                                                               | 60                                                                                | 125                                                                               | 110                                                                               | 745                                                                               | 55                                                                                | 1005                                                                              | 195                                                                               | 655                                                                                 | 1270                                                                                | 65                                                                                  |
| Future Volume (veh/h)        | 65                                                                                | 185                                                                               | 60                                                                                | 125                                                                               | 110                                                                               | 745                                                                               | 55                                                                                | 1005                                                                              | 195                                                                               | 655                                                                                 | 1270                                                                                | 65                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                                |                                                                                     | 0.99                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 71                                                                                | 201                                                                               | 13                                                                                | 136                                                                               | 120                                                                               | 505                                                                               | 60                                                                                | 1092                                                                              | 130                                                                               | 712                                                                                 | 1380                                                                                | 69                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 2                                                                                 | 1                                                                                 | 2                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 114                                                                               | 278                                                                               | 393                                                                               | 253                                                                               | 639                                                                               | 535                                                                               | 77                                                                                | 1260                                                                              | 559                                                                               | 751                                                                                 | 1822                                                                                | 91                                                                                  |
| Arrive On Green              | 0.25                                                                              | 0.25                                                                              | 0.25                                                                              | 0.06                                                                              | 0.34                                                                              | 0.34                                                                              | 0.04                                                                              | 0.36                                                                              | 0.36                                                                              | 0.44                                                                                | 1.00                                                                                | 1.00                                                                                |
| Sat Flow, veh/h              | 325                                                                               | 1096                                                                              | 1550                                                                              | 1774                                                                              | 1863                                                                              | 1558                                                                              | 1774                                                                              | 3539                                                                              | 1570                                                                              | 3442                                                                                | 3430                                                                                | 171                                                                                 |
| Grp Volume(v), veh/h         | 272                                                                               | 0                                                                                 | 13                                                                                | 136                                                                               | 120                                                                               | 505                                                                               | 60                                                                                | 1092                                                                              | 130                                                                               | 712                                                                                 | 711                                                                                 | 738                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1421                                                                              | 0                                                                                 | 1550                                                                              | 1774                                                                              | 1863                                                                              | 1558                                                                              | 1774                                                                              | 1770                                                                              | 1570                                                                              | 1721                                                                                | 1770                                                                                | 1831                                                                                |
| Q Serve(g_s), s              | 21.7                                                                              | 0.0                                                                               | 0.9                                                                               | 8.1                                                                               | 6.6                                                                               | 45.7                                                                              | 4.9                                                                               | 41.7                                                                              | 8.4                                                                               | 28.8                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Cycle Q Clear(g_c), s        | 25.2                                                                              | 0.0                                                                               | 0.9                                                                               | 8.1                                                                               | 6.6                                                                               | 45.7                                                                              | 4.9                                                                               | 41.7                                                                              | 8.4                                                                               | 28.8                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Prop In Lane                 | 0.26                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 0.09                                                                                |
| Lane Grp Cap(c), veh/h       | 391                                                                               | 0                                                                                 | 393                                                                               | 253                                                                               | 639                                                                               | 535                                                                               | 77                                                                                | 1260                                                                              | 559                                                                               | 751                                                                                 | 940                                                                                 | 973                                                                                 |
| V/C Ratio(X)                 | 0.69                                                                              | 0.00                                                                              | 0.03                                                                              | 0.54                                                                              | 0.19                                                                              | 0.94                                                                              | 0.78                                                                              | 0.87                                                                              | 0.23                                                                              | 0.95                                                                                | 0.76                                                                                | 0.76                                                                                |
| Avail Cap(c_a), veh/h        | 413                                                                               | 0                                                                                 | 417                                                                               | 253                                                                               | 668                                                                               | 559                                                                               | 110                                                                               | 1260                                                                              | 559                                                                               | 807                                                                                 | 940                                                                                 | 973                                                                                 |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.88                                                                              | 0.88                                                                              | 0.88                                                                              | 0.24                                                                                | 0.24                                                                                | 0.24                                                                                |
| Uniform Delay (d), s/veh     | 49.3                                                                              | 0.0                                                                               | 40.8                                                                              | 38.2                                                                              | 33.4                                                                              | 46.3                                                                              | 68.7                                                                              | 43.5                                                                              | 32.8                                                                              | 40.1                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Incr Delay (d2), s/veh       | 4.7                                                                               | 0.0                                                                               | 0.0                                                                               | 2.3                                                                               | 0.1                                                                               | 24.6                                                                              | 11.0                                                                              | 7.3                                                                               | 0.9                                                                               | 6.4                                                                                 | 1.4                                                                                 | 1.4                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 10.6                                                                              | 0.0                                                                               | 0.4                                                                               | 4.1                                                                               | 3.4                                                                               | 23.3                                                                              | 2.6                                                                               | 21.6                                                                              | 3.8                                                                               | 14.2                                                                                | 0.4                                                                                 | 0.4                                                                                 |
| LnGrp Delay(d),s/veh         | 54.1                                                                              | 0.0                                                                               | 40.8                                                                              | 40.5                                                                              | 33.6                                                                              | 70.9                                                                              | 79.7                                                                              | 50.8                                                                              | 33.6                                                                              | 46.5                                                                                | 1.4                                                                                 | 1.4                                                                                 |
| LnGrp LOS                    | D                                                                                 |                                                                                   | D                                                                                 | D                                                                                 | C                                                                                 | E                                                                                 | E                                                                                 | D                                                                                 | C                                                                                 | D                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 285                                                                               |                                                                                   | 761                                                                               |                                                                                   |                                                                                   |                                                                                   | 1282                                                                              |                                                                                   |                                                                                   | 2161                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 53.4                                                                              |                                                                                   | 59.6                                                                              |                                                                                   |                                                                                   |                                                                                   | 50.4                                                                              |                                                                                   |                                                                                   | 16.2                                                                                |                                                                                     |                                                                                     |
| Approach LOS                 | D                                                                                 |                                                                                   | E                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | B                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 30.3                                                                              | 81.0                                                                              | 13.0                                                                              | 40.7                                                                              | 35.6                                                                              | 55.6                                                                              | 53.7                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 71.0                                                                              | 8.0                                                                               | 38.0                                                                              | 34.0                                                                              | 46.0                                                                              | 51.0                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+10), s | 10.9                                                                              | 2.0                                                                               | 10.1                                                                              | 27.2                                                                              | 30.8                                                                              | 43.7                                                                              | 47.7                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 26.1                                                                              | 0.0                                                                               | 1.0                                                                               | 0.8                                                                               | 1.9                                                                               | 1.1                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          | 35.7                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 | D                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

HCM 2010 TWSC  
12: RIRO Access & Honoapiilani Highway

10/05/2017

| Intersection             |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
|--------------------------|--------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh         | 0.5    |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
| Movement                 | WBL    | WBR                                                                               | NBT                                                                               | NBR                                                                               | SBL    | SBT                                                                                 |
| Lane Configurations      |        |  |  |  |        |  |
| Traffic Vol, veh/h       | 0      | 50                                                                                | 925                                                                               | 65                                                                                | 0      | 890                                                                                 |
| Future Vol, veh/h        | 0      | 50                                                                                | 925                                                                               | 65                                                                                | 0      | 890                                                                                 |
| Conflicting Peds, #/hr   | 0      | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0      | 0                                                                                   |
| Sign Control             | Stop   | Stop                                                                              | Free                                                                              | Free                                                                              | Free   | Free                                                                                |
| RT Channelized           | -      | None                                                                              | -                                                                                 | None                                                                              | -      | None                                                                                |
| Storage Length           | -      | 0                                                                                 | -                                                                                 | 0                                                                                 | -      | -                                                                                   |
| Veh in Median Storage, # | 0      | -                                                                                 | 0                                                                                 | -                                                                                 | -      | 0                                                                                   |
| Grade, %                 | 0      | -                                                                                 | 0                                                                                 | -                                                                                 | -      | 0                                                                                   |
| Peak Hour Factor         | 92     | 92                                                                                | 92                                                                                | 92                                                                                | 92     | 92                                                                                  |
| Heavy Vehicles, %        | 2      | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2      | 2                                                                                   |
| Mvmt Flow                | 0      | 54                                                                                | 1005                                                                              | 71                                                                                | 0      | 967                                                                                 |
|                          |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
| Major/Minor              | Minor1 |                                                                                   | Major1                                                                            |                                                                                   | Major2 |                                                                                     |
| Conflicting Flow All     | -      | 1005                                                                              | 0                                                                                 | 0                                                                                 | -      | -                                                                                   |
| Stage 1                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Stage 2                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Critical Hdwy            | -      | 6.22                                                                              | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Critical Hdwy Stg 1      | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Critical Hdwy Stg 2      | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Follow-up Hdwy           | -      | 3.318                                                                             | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Pot Cap-1 Maneuver       | 0      | 293                                                                               | -                                                                                 | -                                                                                 | 0      | -                                                                                   |
| Stage 1                  | 0      | -                                                                                 | -                                                                                 | -                                                                                 | 0      | -                                                                                   |
| Stage 2                  | 0      | -                                                                                 | -                                                                                 | -                                                                                 | 0      | -                                                                                   |
| Platoon blocked, %       |        |                                                                                   | -                                                                                 | -                                                                                 |        | -                                                                                   |
| Mov Cap-1 Maneuver       | -      | 293                                                                               | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Mov Cap-2 Maneuver       | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Stage 1                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Stage 2                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
|                          |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
| Approach                 | WB     |                                                                                   | NB                                                                                |                                                                                   | SB     |                                                                                     |
| HCM Control Delay, s     | 20.1   |                                                                                   | 0                                                                                 |                                                                                   | 0      |                                                                                     |
| HCM LOS                  | C      |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
|                          |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
| Minor Lane/Major Mvmt    | NBT    | NBRWBLn1                                                                          | SBT                                                                               |                                                                                   |        |                                                                                     |
| Capacity (veh/h)         | -      | - 293                                                                             | -                                                                                 |                                                                                   |        |                                                                                     |
| HCM Lane V/C Ratio       | -      | - 0.185                                                                           | -                                                                                 |                                                                                   |        |                                                                                     |
| HCM Control Delay (s)    | -      | - 20.1                                                                            | -                                                                                 |                                                                                   |        |                                                                                     |
| HCM Lane LOS             | -      | - C                                                                               | -                                                                                 |                                                                                   |        |                                                                                     |
| HCM 95th %tile Q(veh)    | -      | - 0.7                                                                             | -                                                                                 |                                                                                   |        |                                                                                     |

HCM 2010 TWSC  
13: Honoapiilani Highway & Road J

10/05/2017

| Intersection                                                                                                         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
|----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh                                                                                                     | 1.9                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Movement                                                                                                             | WBL                                                                               | WBR                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 |
| Lane Configurations                                                                                                  |  |  |  |  |  |  |
| Traffic Vol, veh/h                                                                                                   | 55                                                                                | 30                                                                                | 1120                                                                              | 80                                                                                | 45                                                                                  | 970                                                                                 |
| Future Vol, veh/h                                                                                                    | 55                                                                                | 30                                                                                | 1120                                                                              | 80                                                                                | 45                                                                                  | 970                                                                                 |
| Conflicting Peds, #/hr                                                                                               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   |
| Sign Control                                                                                                         | Stop                                                                              | Stop                                                                              | Free                                                                              | Free                                                                              | Free                                                                                | Free                                                                                |
| RT Channelized                                                                                                       | -                                                                                 | None                                                                              | -                                                                                 | None                                                                              | -                                                                                   | None                                                                                |
| Storage Length                                                                                                       | 0                                                                                 | 100                                                                               | -                                                                                 | 100                                                                               | 100                                                                                 | -                                                                                   |
| Veh in Median Storage, #                                                                                             | 0                                                                                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                   | 0                                                                                   |
| Grade, %                                                                                                             | 0                                                                                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                   | 0                                                                                   |
| Peak Hour Factor                                                                                                     | 92                                                                                | 92                                                                                | 92                                                                                | 92                                                                                | 92                                                                                  | 92                                                                                  |
| Heavy Vehicles, %                                                                                                    | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   |
| Mvmt Flow                                                                                                            | 60                                                                                | 33                                                                                | 1217                                                                              | 87                                                                                | 49                                                                                  | 1054                                                                                |
|                                                                                                                      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Major/Minor                                                                                                          | Minor1                                                                            |                                                                                   | Major1                                                                            |                                                                                   | Major2                                                                              |                                                                                     |
| Conflicting Flow All                                                                                                 | 2369                                                                              | 1217                                                                              | 0                                                                                 | 0                                                                                 | 1304                                                                                | 0                                                                                   |
| Stage 1                                                                                                              | 1217                                                                              | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 2                                                                                                              | 1152                                                                              | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Critical Hdwy                                                                                                        | 6.42                                                                              | 6.22                                                                              | -                                                                                 | -                                                                                 | 4.12                                                                                | -                                                                                   |
| Critical Hdwy Stg 1                                                                                                  | 5.42                                                                              | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Critical Hdwy Stg 2                                                                                                  | 5.42                                                                              | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Follow-up Hdwy                                                                                                       | 3.518                                                                             | 3.318                                                                             | -                                                                                 | -                                                                                 | 2.218                                                                               | -                                                                                   |
| Pot Cap-1 Maneuver                                                                                                   | ~ 38                                                                              | 220                                                                               | -                                                                                 | -                                                                                 | 531                                                                                 | -                                                                                   |
| Stage 1                                                                                                              | 280                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 2                                                                                                              | 301                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Platoon blocked, %                                                                                                   |                                                                                   |                                                                                   | -                                                                                 | -                                                                                 |                                                                                     | -                                                                                   |
| Mov Cap-1 Maneuver                                                                                                   | ~ 35                                                                              | 220                                                                               | -                                                                                 | -                                                                                 | 531                                                                                 | -                                                                                   |
| Mov Cap-2 Maneuver                                                                                                   | 131                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 1                                                                                                              | 254                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 2                                                                                                              | 301                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
|                                                                                                                      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Approach                                                                                                             | WB                                                                                |                                                                                   | NB                                                                                |                                                                                   | SB                                                                                  |                                                                                     |
| HCM Control Delay, s                                                                                                 | 43.3                                                                              |                                                                                   | 0                                                                                 |                                                                                   | 0.6                                                                                 |                                                                                     |
| HCM LOS                                                                                                              | E                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
|                                                                                                                      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Minor Lane/Major Mvmt                                                                                                | NBT                                                                               | NBR                                                                               | WBLn1                                                                             | WBLn2                                                                             | SBL                                                                                 | SBT                                                                                 |
| Capacity (veh/h)                                                                                                     | -                                                                                 | -                                                                                 | 131                                                                               | 220                                                                               | 531                                                                                 | -                                                                                   |
| HCM Lane V/C Ratio                                                                                                   | -                                                                                 | -                                                                                 | 0.456                                                                             | 0.148                                                                             | 0.092                                                                               | -                                                                                   |
| HCM Control Delay (s)                                                                                                | -                                                                                 | -                                                                                 | 53.7                                                                              | 24.2                                                                              | 12.5                                                                                | -                                                                                   |
| HCM Lane LOS                                                                                                         | -                                                                                 | -                                                                                 | F                                                                                 | C                                                                                 | B                                                                                   | -                                                                                   |
| HCM 95th %tile Q(veh)                                                                                                | -                                                                                 | -                                                                                 | 2                                                                                 | 0.5                                                                               | 0.3                                                                                 | -                                                                                   |
|                                                                                                                      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Notes                                                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    *: All major volume in platoon |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |

HCM 2010 TWSC  
14: Road A & Akahele Street

10/05/2017

| Intersection             |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|--------|-------------------------------------------------------------------------------------|-------|--------|-------------------------------------------------------------------------------------|-------|
| Int Delay, s/veh         | 6.8                                                                               |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Movement                 | EBL                                                                               | EBT                                                                               | EBR  | WBL                                                                               | WBT                                                                               | WBR  | NBL    | NBT                                                                                 | NBR   | SBL    | SBT                                                                                 | SBR   |
| Lane Configurations      |  |  |      |  |  |      |        |  |       |        |  |       |
| Traffic Vol, veh/h       | 125                                                                               | 90                                                                                | 80   | 5                                                                                 | 70                                                                                | 10   | 65     | 10                                                                                  | 15    | 30     | 10                                                                                  | 105   |
| Future Vol, veh/h        | 125                                                                               | 90                                                                                | 80   | 5                                                                                 | 70                                                                                | 10   | 65     | 10                                                                                  | 15    | 30     | 10                                                                                  | 105   |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0      | 0                                                                                   | 0     | 0      | 0                                                                                   | 0     |
| Sign Control             | Free                                                                              | Free                                                                              | Free | Free                                                                              | Free                                                                              | Free | Stop   | Stop                                                                                | Stop  | Stop   | Stop                                                                                | Stop  |
| RT Channelized           | -                                                                                 | -                                                                                 | None | -                                                                                 | -                                                                                 | None | -      | -                                                                                   | None  | -      | -                                                                                   | None  |
| Storage Length           | 100                                                                               | -                                                                                 | -    | 100                                                                               | -                                                                                 | -    | -      | -                                                                                   | -     | -      | -                                                                                   | -     |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | -    | -                                                                                 | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Grade, %                 | -                                                                                 | 0                                                                                 | -    | -                                                                                 | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Peak Hour Factor         | 92                                                                                | 92                                                                                | 92   | 92                                                                                | 92                                                                                | 92   | 92     | 92                                                                                  | 92    | 92     | 92                                                                                  | 92    |
| Heavy Vehicles, %        | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    | 2      | 2                                                                                   | 2     | 2      | 2                                                                                   | 2     |
| Mvmt Flow                | 136                                                                               | 98                                                                                | 87   | 5                                                                                 | 76                                                                                | 11   | 71     | 11                                                                                  | 16    | 33     | 11                                                                                  | 114   |
|                          |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Major/Minor              | Major1                                                                            |                                                                                   |      | Major2                                                                            |                                                                                   |      | Minor1 |                                                                                     |       | Minor2 |                                                                                     |       |
| Conflicting Flow All     | 87                                                                                | 0                                                                                 | 0    | 185                                                                               | 0                                                                                 | 0    | 568    | 511                                                                                 | 142   | 519    | 549                                                                                 | 82    |
| Stage 1                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 414    | 414                                                                                 | -     | 92     | 92                                                                                  | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 154    | 97                                                                                  | -     | 427    | 457                                                                                 | -     |
| Critical Hdwy            | 4.12                                                                              | -                                                                                 | -    | 4.12                                                                              | -                                                                                 | -    | 7.12   | 6.52                                                                                | 6.22  | 7.12   | 6.52                                                                                | 6.22  |
| Critical Hdwy Stg 1      | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Critical Hdwy Stg 2      | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Follow-up Hdwy           | 2.218                                                                             | -                                                                                 | -    | 2.218                                                                             | -                                                                                 | -    | 3.518  | 4.018                                                                               | 3.318 | 3.518  | 4.018                                                                               | 3.318 |
| Pot Cap-1 Maneuver       | 1509                                                                              | -                                                                                 | -    | 1390                                                                              | -                                                                                 | -    | 434    | 466                                                                                 | 906   | 467    | 443                                                                                 | 978   |
| Stage 1                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 616    | 593                                                                                 | -     | 915    | 819                                                                                 | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 848    | 815                                                                                 | -     | 606    | 568                                                                                 | -     |
| Platoon blocked, %       |                                                                                   | -                                                                                 | -    |                                                                                   | -                                                                                 | -    |        |                                                                                     |       |        |                                                                                     |       |
| Mov Cap-1 Maneuver       | 1509                                                                              | -                                                                                 | -    | 1390                                                                              | -                                                                                 | -    | 349    | 422                                                                                 | 906   | 417    | 401                                                                                 | 978   |
| Mov Cap-2 Maneuver       | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 349    | 422                                                                                 | -     | 417    | 401                                                                                 | -     |
| Stage 1                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 561    | 540                                                                                 | -     | 833    | 816                                                                                 | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 736    | 812                                                                                 | -     | 531    | 517                                                                                 | -     |
|                          |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Approach                 | EB                                                                                |                                                                                   |      | WB                                                                                |                                                                                   |      | NB     |                                                                                     |       | SB     |                                                                                     |       |
| HCM Control Delay, s     | 3.2                                                                               |                                                                                   |      | 0.4                                                                               |                                                                                   |      | 17     |                                                                                     |       | 11.5   |                                                                                     |       |
| HCM LOS                  |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      | C      |                                                                                     |       | B      |                                                                                     |       |
|                          |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Minor Lane/Major Mvmt    | NBLn1                                                                             | EBL                                                                               | EBT  | EBR                                                                               | WBL                                                                               | WBT  | WBR    | SBLn1                                                                               |       |        |                                                                                     |       |
| Capacity (veh/h)         | 397                                                                               | 1509                                                                              | -    | -                                                                                 | 1390                                                                              | -    | -      | 710                                                                                 |       |        |                                                                                     |       |
| HCM Lane V/C Ratio       | 0.246                                                                             | 0.09                                                                              | -    | -                                                                                 | 0.004                                                                             | -    | -      | 0.222                                                                               |       |        |                                                                                     |       |
| HCM Control Delay (s)    | 17                                                                                | 7.6                                                                               | -    | -                                                                                 | 7.6                                                                               | -    | -      | 11.5                                                                                |       |        |                                                                                     |       |
| HCM Lane LOS             | C                                                                                 | A                                                                                 | -    | -                                                                                 | A                                                                                 | -    | -      | B                                                                                   |       |        |                                                                                     |       |
| HCM 95th %tile Q(veh)    | 1                                                                                 | 0.3                                                                               | -    | -                                                                                 | 0                                                                                 | -    | -      | 0.8                                                                                 |       |        |                                                                                     |       |

| Intersection             |        |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
|--------------------------|--------|-----------------------------------------------------------------------------------|------|--------|-----------------------------------------------------------------------------------|------|--------|-------------------------------------------------------------------------------------|-------|--------|-------------------------------------------------------------------------------------|-------|
| Int Delay, s/veh         | 4.5    |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Movement                 | EBL    | EBT                                                                               | EBR  | WBL    | WBT                                                                               | WBR  | NBL    | NBT                                                                                 | NBR   | SBL    | SBT                                                                                 | SBR   |
| Lane Configurations      |        |  |      |        |  |      |        |  |       |        |  |       |
| Traffic Vol, veh/h       | 30     | 15                                                                                | 90   | 5      | 20                                                                                | 5    | 50     | 5                                                                                   | 5     | 5      | 5                                                                                   | 20    |
| Future Vol, veh/h        | 30     | 15                                                                                | 90   | 5      | 20                                                                                | 5    | 50     | 5                                                                                   | 5     | 5      | 5                                                                                   | 20    |
| Conflicting Peds, #/hr   | 0      | 0                                                                                 | 0    | 0      | 0                                                                                 | 0    | 0      | 0                                                                                   | 0     | 0      | 0                                                                                   | 0     |
| Sign Control             | Free   | Free                                                                              | Free | Free   | Free                                                                              | Free | Stop   | Stop                                                                                | Stop  | Stop   | Stop                                                                                | Stop  |
| RT Channelized           | -      | -                                                                                 | None | -      | -                                                                                 | None | -      | -                                                                                   | None  | -      | -                                                                                   | None  |
| Storage Length           | -      | -                                                                                 | -    | -      | -                                                                                 | -    | -      | -                                                                                   | -     | -      | -                                                                                   | -     |
| Veh in Median Storage, # | -      | 0                                                                                 | -    | -      | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Grade, %                 | -      | 0                                                                                 | -    | -      | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Peak Hour Factor         | 92     | 92                                                                                | 92   | 92     | 92                                                                                | 92   | 92     | 92                                                                                  | 92    | 92     | 92                                                                                  | 92    |
| Heavy Vehicles, %        | 2      | 2                                                                                 | 2    | 2      | 2                                                                                 | 2    | 2      | 2                                                                                   | 2     | 2      | 2                                                                                   | 2     |
| Mvmt Flow                | 33     | 16                                                                                | 98   | 5      | 22                                                                                | 5    | 54     | 5                                                                                   | 5     | 5      | 5                                                                                   | 22    |
|                          |        |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Major/Minor              | Major1 |                                                                                   |      | Major2 |                                                                                   |      | Minor1 |                                                                                     |       | Minor2 |                                                                                     |       |
| Conflicting Flow All     | 27     | 0                                                                                 | 0    | 114    | 0                                                                                 | 0    | 179    | 168                                                                                 | 65    | 171    | 215                                                                                 | 25    |
| Stage 1                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 131    | 131                                                                                 | -     | 35     | 35                                                                                  | -     |
| Stage 2                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 48     | 37                                                                                  | -     | 136    | 180                                                                                 | -     |
| Critical Hdwy            | 4.12   | -                                                                                 | -    | 4.12   | -                                                                                 | -    | 7.12   | 6.52                                                                                | 6.22  | 7.12   | 6.52                                                                                | 6.22  |
| Critical Hdwy Stg 1      | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Critical Hdwy Stg 2      | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Follow-up Hdwy           | 2.218  | -                                                                                 | -    | 2.218  | -                                                                                 | -    | 3.518  | 4.018                                                                               | 3.318 | 3.518  | 4.018                                                                               | 3.318 |
| Pot Cap-1 Maneuver       | 1587   | -                                                                                 | -    | 1475   | -                                                                                 | -    | 783    | 725                                                                                 | 999   | 792    | 683                                                                                 | 1051  |
| Stage 1                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 873    | 788                                                                                 | -     | 981    | 866                                                                                 | -     |
| Stage 2                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 965    | 864                                                                                 | -     | 867    | 750                                                                                 | -     |
| Platoon blocked, %       |        | -                                                                                 | -    |        | -                                                                                 | -    |        |                                                                                     |       |        |                                                                                     |       |
| Mov Cap-1 Maneuver       | 1587   | -                                                                                 | -    | 1475   | -                                                                                 | -    | 748    | 707                                                                                 | 999   | 768    | 666                                                                                 | 1051  |
| Mov Cap-2 Maneuver       | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 748    | 707                                                                                 | -     | 768    | 666                                                                                 | -     |
| Stage 1                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 854    | 771                                                                                 | -     | 959    | 863                                                                                 | -     |
| Stage 2                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 936    | 861                                                                                 | -     | 837    | 734                                                                                 | -     |
|                          |        |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Approach                 | EB     |                                                                                   |      | WB     |                                                                                   |      | NB     |                                                                                     |       | SB     |                                                                                     |       |
| HCM Control Delay, s     | 1.6    |                                                                                   |      | 1.2    |                                                                                   |      | 10.2   |                                                                                     |       | 9.1    |                                                                                     |       |
| HCM LOS                  |        |                                                                                   |      |        |                                                                                   |      | B      |                                                                                     |       | A      |                                                                                     |       |
|                          |        |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Minor Lane/Major Mvmt    | NBLn1  | EBL                                                                               | EBT  | EBR    | WBL                                                                               | WBT  | WBR    | SBLn1                                                                               |       |        |                                                                                     |       |
| Capacity (veh/h)         | 760    | 1587                                                                              | -    | -      | 1475                                                                              | -    | -      | 908                                                                                 |       |        |                                                                                     |       |
| HCM Lane V/C Ratio       | 0.086  | 0.021                                                                             | -    | -      | 0.004                                                                             | -    | -      | 0.036                                                                               |       |        |                                                                                     |       |
| HCM Control Delay (s)    | 10.2   | 7.3                                                                               | 0    | -      | 7.5                                                                               | 0    | -      | 9.1                                                                                 |       |        |                                                                                     |       |
| HCM Lane LOS             | B      | A                                                                                 | A    | -      | A                                                                                 | A    | -      | A                                                                                   |       |        |                                                                                     |       |
| HCM 95th %tile O(veh)    | 0.3    | 0.1                                                                               | -    | -      | 0                                                                                 | -    | -      | 0.1                                                                                 |       |        |                                                                                     |       |



| Intersection             |                                                                                   |      |        |                                                                                   |                                                                                     |       |
|--------------------------|-----------------------------------------------------------------------------------|------|--------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------|
| Int Delay, s/veh         | 1.9                                                                               |      |        |                                                                                   |                                                                                     |       |
| Movement                 | EBT                                                                               | EBR  | WBL    | WBT                                                                               | NBL                                                                                 | NBR   |
| Lane Configurations      |  |      |        |  |  |       |
| Traffic Vol, veh/h       | 85                                                                                | 40   | 5      | 45                                                                                | 35                                                                                  | 5     |
| Future Vol, veh/h        | 85                                                                                | 40   | 5      | 45                                                                                | 35                                                                                  | 5     |
| Conflicting Peds, #/hr   | 0                                                                                 | 0    | 0      | 0                                                                                 | 0                                                                                   | 0     |
| Sign Control             | Free                                                                              | Free | Free   | Free                                                                              | Stop                                                                                | Stop  |
| RT Channelized           | -                                                                                 | None | -      | None                                                                              | -                                                                                   | None  |
| Storage Length           | -                                                                                 | -    | -      | -                                                                                 | 0                                                                                   | -     |
| Veh in Median Storage, # | 0                                                                                 | -    | -      | 0                                                                                 | 0                                                                                   | -     |
| Grade, %                 | 0                                                                                 | -    | -      | 0                                                                                 | 0                                                                                   | -     |
| Peak Hour Factor         | 92                                                                                | 92   | 92     | 92                                                                                | 92                                                                                  | 92    |
| Heavy Vehicles, %        | 2                                                                                 | 2    | 2      | 2                                                                                 | 2                                                                                   | 2     |
| Mvmt Flow                | 92                                                                                | 43   | 5      | 49                                                                                | 38                                                                                  | 5     |
| Major/Minor              | Major1                                                                            |      | Major2 |                                                                                   | Minor1                                                                              |       |
| Conflicting Flow All     | 0                                                                                 | 0    | 135    | 0                                                                                 | 173                                                                                 | 114   |
| Stage 1                  | -                                                                                 | -    | -      | -                                                                                 | 114                                                                                 | -     |
| Stage 2                  | -                                                                                 | -    | -      | -                                                                                 | 59                                                                                  | -     |
| Critical Hdwy            | -                                                                                 | -    | 4.12   | -                                                                                 | 6.42                                                                                | 6.22  |
| Critical Hdwy Stg 1      | -                                                                                 | -    | -      | -                                                                                 | 5.42                                                                                | -     |
| Critical Hdwy Stg 2      | -                                                                                 | -    | -      | -                                                                                 | 5.42                                                                                | -     |
| Follow-up Hdwy           | -                                                                                 | -    | 2.218  | -                                                                                 | 3.518                                                                               | 3.318 |
| Pot Cap-1 Maneuver       | -                                                                                 | -    | 1449   | -                                                                                 | 817                                                                                 | 939   |
| Stage 1                  | -                                                                                 | -    | -      | -                                                                                 | 911                                                                                 | -     |
| Stage 2                  | -                                                                                 | -    | -      | -                                                                                 | 964                                                                                 | -     |
| Platoon blocked, %       | -                                                                                 | -    | -      | -                                                                                 | -                                                                                   | -     |
| Mov Cap-1 Maneuver       | -                                                                                 | -    | 1449   | -                                                                                 | 814                                                                                 | 939   |
| Mov Cap-2 Maneuver       | -                                                                                 | -    | -      | -                                                                                 | 814                                                                                 | -     |
| Stage 1                  | -                                                                                 | -    | -      | -                                                                                 | 907                                                                                 | -     |
| Stage 2                  | -                                                                                 | -    | -      | -                                                                                 | 964                                                                                 | -     |
| Approach                 | EB                                                                                |      | WB     |                                                                                   | NB                                                                                  |       |
| HCM Control Delay, s     | 0                                                                                 |      | 0.7    |                                                                                   | 9.6                                                                                 |       |
| HCM LOS                  |                                                                                   |      |        |                                                                                   | A                                                                                   |       |
| Minor Lane/Major Mvmt    | NBLn1                                                                             | EBT  | EBR    | WBL                                                                               | WBT                                                                                 |       |
| Capacity (veh/h)         | 828                                                                               | -    | -      | 1449                                                                              | -                                                                                   |       |
| HCM Lane V/C Ratio       | 0.053                                                                             | -    | -      | 0.004                                                                             | -                                                                                   |       |
| HCM Control Delay (s)    | 9.6                                                                               | -    | -      | 7.5                                                                               | 0                                                                                   |       |
| HCM Lane LOS             | A                                                                                 | -    | -      | A                                                                                 | A                                                                                   |       |
| HCM 95th %tile Q(veh)    | 0.2                                                                               | -    | -      | 0                                                                                 | -                                                                                   |       |

HCM 2010 Roundabout  
17: Road F & Road J

10/05/2017

| Intersection                |       |       |       |
|-----------------------------|-------|-------|-------|
| Intersection Delay, s/veh   | 3.9   |       |       |
| Intersection LOS            | A     |       |       |
| Approach                    | EB    | WB    | NB    |
| Entry Lanes                 | 1     | 1     | 1     |
| Conflicting Circle Lanes    | 1     | 1     | 1     |
| Adj Approach Flow, veh/h    | 97    | 32    | 27    |
| Demand Flow Rate, veh/h     | 99    | 33    | 27    |
| Vehicles Circulating, veh/h | 5     | 22    | 55    |
| Vehicles Exiting, veh/h     | 50    | 60    | 49    |
| Follow-Up Headway, s        | 3.186 | 3.186 | 3.186 |
| Ped Vol Crossing Leg, #/h   | 0     | 0     | 0     |
| Ped Cap Adj                 | 1.000 | 1.000 | 1.000 |
| Approach Delay, s/veh       | 4.0   | 3.6   | 3.6   |
| Approach LOS                | A     | A     | A     |
| Lane                        | Left  | Left  | Left  |
| Designated Moves            | TR    | LT    | LR    |
| Assumed Moves               | TR    | LT    | LR    |
| RT Channelized              |       |       |       |
| Lane Util                   | 1.000 | 1.000 | 1.000 |
| Critical Headway, s         | 5.193 | 5.193 | 5.193 |
| Entry Flow, veh/h           | 99    | 33    | 27    |
| Cap Entry Lane, veh/h       | 1124  | 1105  | 1069  |
| Entry HV Adj Factor         | 0.979 | 0.983 | 1.000 |
| Flow Entry, veh/h           | 97    | 32    | 27    |
| Cap Entry, veh/h            | 1101  | 1087  | 1069  |
| V/C Ratio                   | 0.088 | 0.030 | 0.025 |
| Control Delay, s/veh        | 4.0   | 3.6   | 3.6   |
| LOS                         | A     | A     | A     |
| 95th %tile Queue, veh       | 0     | 0     | 0     |



---

## **APPENDIX C**

### LEVEL OF SERVICE CALCULATIONS

- Future Year 2022 Scenario 3 WE Peak
-

# HCM 2010 Signalized Intersection Summary

## 1: Napilihau Street

10/05/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 40                                                                                | 45                                                                                | 385                                                                               | 50                                                                                | 50                                                                                | 20                                                                                | 325                                                                                 | 370                                                                                 | 45                                                                                  | 20                                                                                  | 325                                                                                 | 90                                                                                  |
| Future Volume (veh/h)        | 40                                                                                | 45                                                                                | 385                                                                               | 50                                                                                | 50                                                                                | 20                                                                                | 325                                                                                 | 370                                                                                 | 45                                                                                  | 20                                                                                  | 325                                                                                 | 90                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.99                                                                              | 0.99                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 43                                                                                | 49                                                                                | 34                                                                                | 54                                                                                | 54                                                                                | 10                                                                                | 353                                                                                 | 402                                                                                 | 28                                                                                  | 22                                                                                  | 353                                                                                 | 28                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 173                                                                               | 126                                                                               | 193                                                                               | 234                                                                               | 188                                                                               | 35                                                                                | 436                                                                                 | 1002                                                                                | 850                                                                                 | 28                                                                                  | 573                                                                                 | 487                                                                                 |
| Arrive On Green              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.25                                                                                | 0.54                                                                                | 0.54                                                                                | 0.02                                                                                | 0.31                                                                                | 0.31                                                                                |
| Sat Flow, veh/h              | 540                                                                               | 1021                                                                              | 1564                                                                              | 1299                                                                              | 1526                                                                              | 283                                                                               | 1774                                                                                | 1863                                                                                | 1580                                                                                | 1774                                                                                | 1863                                                                                | 1581                                                                                |
| Grp Volume(v), veh/h         | 92                                                                                | 0                                                                                 | 34                                                                                | 54                                                                                | 0                                                                                 | 64                                                                                | 353                                                                                 | 402                                                                                 | 28                                                                                  | 22                                                                                  | 353                                                                                 | 28                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1561                                                                              | 0                                                                                 | 1564                                                                              | 1299                                                                              | 0                                                                                 | 1809                                                                              | 1774                                                                                | 1863                                                                                | 1580                                                                                | 1774                                                                                | 1863                                                                                | 1581                                                                                |
| Q Serve(g_s), s              | 1.1                                                                               | 0.0                                                                               | 1.0                                                                               | 2.0                                                                               | 0.0                                                                               | 1.6                                                                               | 9.3                                                                                 | 6.3                                                                                 | 0.4                                                                                 | 0.6                                                                                 | 8.0                                                                                 | 0.6                                                                                 |
| Cycle Q Clear(g_c), s        | 2.7                                                                               | 0.0                                                                               | 1.0                                                                               | 4.7                                                                               | 0.0                                                                               | 1.6                                                                               | 9.3                                                                                 | 6.3                                                                                 | 0.4                                                                                 | 0.6                                                                                 | 8.0                                                                                 | 0.6                                                                                 |
| Prop In Lane                 | 0.47                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.16                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 299                                                                               | 0                                                                                 | 193                                                                               | 234                                                                               | 0                                                                                 | 223                                                                               | 436                                                                                 | 1002                                                                                | 850                                                                                 | 28                                                                                  | 573                                                                                 | 487                                                                                 |
| V/C Ratio(X)                 | 0.31                                                                              | 0.00                                                                              | 0.18                                                                              | 0.23                                                                              | 0.00                                                                              | 0.29                                                                              | 0.81                                                                                | 0.40                                                                                | 0.03                                                                                | 0.78                                                                                | 0.62                                                                                | 0.06                                                                                |
| Avail Cap(c_a), veh/h        | 864                                                                               | 0                                                                                 | 758                                                                               | 703                                                                               | 0                                                                                 | 877                                                                               | 1075                                                                                | 2972                                                                                | 2521                                                                                | 537                                                                                 | 2407                                                                                | 2043                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 20.2                                                                              | 0.0                                                                               | 19.5                                                                              | 22.4                                                                              | 0.0                                                                               | 19.7                                                                              | 17.6                                                                                | 6.7                                                                                 | 5.4                                                                                 | 24.3                                                                                | 14.6                                                                                | 12.1                                                                                |
| Incr Delay (d2), s/veh       | 0.6                                                                               | 0.0                                                                               | 0.4                                                                               | 0.5                                                                               | 0.0                                                                               | 0.7                                                                               | 3.6                                                                                 | 0.6                                                                                 | 0.0                                                                                 | 36.5                                                                                | 2.3                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.2                                                                               | 0.0                                                                               | 0.4                                                                               | 0.8                                                                               | 0.0                                                                               | 0.8                                                                               | 5.0                                                                                 | 3.3                                                                                 | 0.2                                                                                 | 0.6                                                                                 | 4.5                                                                                 | 0.3                                                                                 |
| LnGrp Delay(d),s/veh         | 20.7                                                                              | 0.0                                                                               | 19.9                                                                              | 22.9                                                                              | 0.0                                                                               | 20.4                                                                              | 21.2                                                                                | 7.3                                                                                 | 5.4                                                                                 | 60.8                                                                                | 16.9                                                                                | 12.2                                                                                |
| LnGrp LOS                    | C                                                                                 |                                                                                   | B                                                                                 | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 126                                                                               |                                                                                   |                                                                                   | 118                                                                               |                                                                                   |                                                                                     | 783                                                                                 |                                                                                     |                                                                                     | 403                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 20.5                                                                              |                                                                                   |                                                                                   | 21.6                                                                              |                                                                                   |                                                                                     | 13.5                                                                                |                                                                                     |                                                                                     | 19.0                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.8                                                                               | 32.6                                                                              |                                                                                   | 11.1                                                                              | 17.2                                                                              | 21.2                                                                              |                                                                                     | 11.1                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 79.0                                                                              |                                                                                   | 24.0                                                                              | 30.0                                                                              | 64.0                                                                              |                                                                                     | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.6                                                                               | 8.3                                                                               |                                                                                   | 4.7                                                                               | 11.3                                                                              | 10.0                                                                              |                                                                                     | 6.7                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 6.0                                                                               |                                                                                   | 0.5                                                                               | 1.0                                                                               | 5.0                                                                               |                                                                                     | 0.4                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 16.3                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 2: Hoohui Road

10/05/2017

|                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|--------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                       | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations            |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)         | 55                                                                                | 20                                                                                | 245                                                                               | 50                                                                                | 15                                                                                | 5                                                                                 | 170                                                                               | 565                                                                               | 35                                                                                | 15                                                                                  | 595                                                                                 | 60                                                                                  |
| Future Volume (veh/h)          | 55                                                                                | 20                                                                                | 245                                                                               | 50                                                                                | 15                                                                                | 5                                                                                 | 170                                                                               | 565                                                                               | 35                                                                                | 15                                                                                  | 595                                                                                 | 60                                                                                  |
| Number                         | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                 | 2                                                                                 | 12                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)            | 0.98                                                                              |                                                                                   | 0.98                                                                              | 0.99                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln         | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h           | 60                                                                                | 22                                                                                | 21                                                                                | 54                                                                                | 16                                                                                | 1                                                                                 | 185                                                                               | 614                                                                               | 0                                                                                 | 16                                                                                  | 647                                                                                 | 27                                                                                  |
| Adj No. of Lanes               | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor               | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %           | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                     | 264                                                                               | 78                                                                                | 222                                                                               | 275                                                                               | 248                                                                               | 15                                                                                | 418                                                                               | 970                                                                               | 825                                                                               | 397                                                                                 | 822                                                                                 | 696                                                                                 |
| Arrive On Green                | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.09                                                                              | 0.52                                                                              | 0.00                                                                              | 0.01                                                                                | 0.44                                                                                | 0.44                                                                                |
| Sat Flow, veh/h                | 966                                                                               | 546                                                                               | 1556                                                                              | 1339                                                                              | 1733                                                                              | 108                                                                               | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1578                                                                                |
| Grp Volume(v), veh/h           | 82                                                                                | 0                                                                                 | 21                                                                                | 54                                                                                | 0                                                                                 | 17                                                                                | 185                                                                               | 614                                                                               | 0                                                                                 | 16                                                                                  | 647                                                                                 | 27                                                                                  |
| Grp Sat Flow(s),veh/h/ln       | 1512                                                                              | 0                                                                                 | 1556                                                                              | 1339                                                                              | 0                                                                                 | 1841                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1578                                                                                |
| Q Serve(g_s), s                | 1.6                                                                               | 0.0                                                                               | 0.6                                                                               | 1.9                                                                               | 0.0                                                                               | 0.4                                                                               | 2.6                                                                               | 11.6                                                                              | 0.0                                                                               | 0.2                                                                                 | 14.7                                                                                | 0.5                                                                                 |
| Cycle Q Clear(g_c), s          | 2.3                                                                               | 0.0                                                                               | 0.6                                                                               | 4.2                                                                               | 0.0                                                                               | 0.4                                                                               | 2.6                                                                               | 11.6                                                                              | 0.0                                                                               | 0.2                                                                                 | 14.7                                                                                | 0.5                                                                                 |
| Prop In Lane                   | 0.73                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h         | 342                                                                               | 0                                                                                 | 222                                                                               | 275                                                                               | 0                                                                                 | 263                                                                               | 418                                                                               | 970                                                                               | 825                                                                               | 397                                                                                 | 822                                                                                 | 696                                                                                 |
| V/C Ratio(X)                   | 0.24                                                                              | 0.00                                                                              | 0.09                                                                              | 0.20                                                                              | 0.00                                                                              | 0.06                                                                              | 0.44                                                                              | 0.63                                                                              | 0.00                                                                              | 0.04                                                                                | 0.79                                                                                | 0.04                                                                                |
| Avail Cap(c_a), veh/h          | 878                                                                               | 0                                                                                 | 788                                                                               | 762                                                                               | 0                                                                                 | 933                                                                               | 794                                                                               | 1925                                                                              | 1636                                                                              | 915                                                                                 | 1925                                                                                | 1631                                                                                |
| HCM Platoon Ratio              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)             | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh       | 19.1                                                                              | 0.0                                                                               | 18.4                                                                              | 21.0                                                                              | 0.0                                                                               | 18.3                                                                              | 8.8                                                                               | 8.4                                                                               | 0.0                                                                               | 8.1                                                                                 | 11.8                                                                                | 7.8                                                                                 |
| Incr Delay (d2), s/veh         | 0.4                                                                               | 0.0                                                                               | 0.2                                                                               | 0.3                                                                               | 0.0                                                                               | 0.1                                                                               | 0.7                                                                               | 0.7                                                                               | 0.0                                                                               | 0.0                                                                                 | 1.7                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh      | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln       | 1.0                                                                               | 0.0                                                                               | 0.3                                                                               | 0.7                                                                               | 0.0                                                                               | 0.2                                                                               | 1.3                                                                               | 6.0                                                                               | 0.0                                                                               | 0.1                                                                                 | 7.8                                                                                 | 0.2                                                                                 |
| LnGrp Delay(d),s/veh           | 19.4                                                                              | 0.0                                                                               | 18.6                                                                              | 21.3                                                                              | 0.0                                                                               | 18.4                                                                              | 9.5                                                                               | 9.1                                                                               | 0.0                                                                               | 8.1                                                                                 | 13.5                                                                                | 7.9                                                                                 |
| LnGrp LOS                      | B                                                                                 |                                                                                   | B                                                                                 | C                                                                                 |                                                                                   | B                                                                                 | A                                                                                 | A                                                                                 |                                                                                   | A                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h            | 103                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 71                                                                                | 799                                                                               |                                                                                   |                                                                                   | 690                                                                                 |                                                                                     |                                                                                     |
| Approach Delay, s/veh          | 19.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 20.6                                                                              | 9.2                                                                               |                                                                                   |                                                                                   | 13.2                                                                                |                                                                                     |                                                                                     |
| Approach LOS                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   | C                                                                                 | A                                                                                 |                                                                                   |                                                                                   | B                                                                                   |                                                                                     |                                                                                     |
| Timer                          | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                   | 1                                                                                 | 2                                                                                 |                                                                                   |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s       | 5.6                                                                               | 31.7                                                                              |                                                                                   |                                                                                   | 12.1                                                                              | 9.5                                                                               | 27.8                                                                              | 12.1                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s        | 5.0                                                                               | 6.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s    | 15.0                                                                              | 51.0                                                                              |                                                                                   |                                                                                   | 25.0                                                                              | 15.0                                                                              | 51.0                                                                              | 25.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+12.2), s | 12.2                                                                              | 13.6                                                                              |                                                                                   |                                                                                   | 4.3                                                                               | 4.6                                                                               | 16.7                                                                              | 6.2                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s        | 0.0                                                                               | 4.5                                                                               |                                                                                   |                                                                                   | 0.4                                                                               | 0.3                                                                               | 4.9                                                                               | 0.2                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay            |                                                                                   |                                                                                   | 12.0                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 3: Honoapiilani Highway & Akahele Street

10/05/2017

|                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|--------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                |  |  |  |  |  |  |  |  |  |   |  |  |
| Movement                       | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations            |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)         | 45                                                                                | 75                                                                                | 85                                                                                | 215                                                                               | 80                                                                                | 95                                                                                | 85                                                                                | 640                                                                               | 185                                                                               | 165                                                                                 | 680                                                                                 | 50                                                                                  |
| Future Volume (veh/h)          | 45                                                                                | 75                                                                                | 85                                                                                | 215                                                                               | 80                                                                                | 95                                                                                | 85                                                                                | 640                                                                               | 185                                                                               | 165                                                                                 | 680                                                                                 | 50                                                                                  |
| Number                         | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                 | 2                                                                                 | 12                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)            | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln         | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h           | 49                                                                                | 82                                                                                | 63                                                                                | 234                                                                               | 87                                                                                | 17                                                                                | 92                                                                                | 696                                                                               | 131                                                                               | 179                                                                                 | 739                                                                                 | 22                                                                                  |
| Adj No. of Lanes               | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor               | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %           | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                     | 63                                                                                | 107                                                                               | 82                                                                                | 268                                                                               | 420                                                                               | 357                                                                               | 119                                                                               | 784                                                                               | 666                                                                               | 215                                                                                 | 885                                                                                 | 751                                                                                 |
| Arrive On Green                | 0.04                                                                              | 0.11                                                                              | 0.11                                                                              | 0.15                                                                              | 0.23                                                                              | 0.23                                                                              | 0.07                                                                              | 0.42                                                                              | 0.42                                                                              | 0.12                                                                                | 0.47                                                                                | 0.47                                                                                |
| Sat Flow, veh/h                | 1774                                                                              | 972                                                                               | 747                                                                               | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1582                                                                                |
| Grp Volume(v), veh/h           | 49                                                                                | 0                                                                                 | 145                                                                               | 234                                                                               | 87                                                                                | 17                                                                                | 92                                                                                | 696                                                                               | 131                                                                               | 179                                                                                 | 739                                                                                 | 22                                                                                  |
| Grp Sat Flow(s),veh/h/ln       | 1774                                                                              | 0                                                                                 | 1719                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1582                                                                                |
| Q Serve(g_s), s                | 2.8                                                                               | 0.0                                                                               | 8.3                                                                               | 13.1                                                                              | 3.9                                                                               | 0.9                                                                               | 5.2                                                                               | 35.1                                                                              | 5.3                                                                               | 10.0                                                                                | 35.1                                                                                | 0.8                                                                                 |
| Cycle Q Clear(g_c), s          | 2.8                                                                               | 0.0                                                                               | 8.3                                                                               | 13.1                                                                              | 3.9                                                                               | 0.9                                                                               | 5.2                                                                               | 35.1                                                                              | 5.3                                                                               | 10.0                                                                                | 35.1                                                                                | 0.8                                                                                 |
| Prop In Lane                   | 1.00                                                                              |                                                                                   | 0.43                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h         | 63                                                                                | 0                                                                                 | 189                                                                               | 268                                                                               | 420                                                                               | 357                                                                               | 119                                                                               | 784                                                                               | 666                                                                               | 215                                                                                 | 885                                                                                 | 751                                                                                 |
| V/C Ratio(X)                   | 0.77                                                                              | 0.00                                                                              | 0.77                                                                              | 0.87                                                                              | 0.21                                                                              | 0.05                                                                              | 0.77                                                                              | 0.89                                                                              | 0.20                                                                              | 0.83                                                                                | 0.84                                                                                | 0.03                                                                                |
| Avail Cap(c_a), veh/h          | 349                                                                               | 0                                                                                 | 355                                                                               | 349                                                                               | 420                                                                               | 357                                                                               | 436                                                                               | 1191                                                                              | 1012                                                                              | 436                                                                                 | 1191                                                                                | 1011                                                                                |
| HCM Platoon Ratio              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)             | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh       | 48.6                                                                              | 0.0                                                                               | 44.0                                                                              | 42.2                                                                              | 32.0                                                                              | 30.8                                                                              | 46.7                                                                              | 27.2                                                                              | 18.6                                                                              | 43.7                                                                                | 23.2                                                                                | 14.2                                                                                |
| Incr Delay (d2), s/veh         | 17.7                                                                              | 0.0                                                                               | 6.4                                                                               | 17.0                                                                              | 0.2                                                                               | 0.1                                                                               | 10.1                                                                              | 5.7                                                                               | 0.1                                                                               | 8.1                                                                                 | 4.0                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh      | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln       | 1.7                                                                               | 0.0                                                                               | 4.3                                                                               | 7.7                                                                               | 2.0                                                                               | 0.4                                                                               | 2.9                                                                               | 19.2                                                                              | 2.4                                                                               | 5.4                                                                                 | 18.8                                                                                | 0.3                                                                                 |
| LnGrp Delay(d),s/veh           | 66.3                                                                              | 0.0                                                                               | 50.3                                                                              | 59.2                                                                              | 32.2                                                                              | 30.9                                                                              | 56.8                                                                              | 32.9                                                                              | 18.7                                                                              | 51.8                                                                                | 27.2                                                                                | 14.2                                                                                |
| LnGrp LOS                      | E                                                                                 |                                                                                   | D                                                                                 | E                                                                                 | C                                                                                 | C                                                                                 | E                                                                                 | C                                                                                 | B                                                                                 | D                                                                                   | C                                                                                   | B                                                                                   |
| Approach Vol, veh/h            | 194                                                                               |                                                                                   | 338                                                                               |                                                                                   |                                                                                   | 919                                                                               |                                                                                   |                                                                                   | 940                                                                               |                                                                                     |                                                                                     |                                                                                     |
| Approach Delay, s/veh          | 54.4                                                                              |                                                                                   | 50.8                                                                              |                                                                                   |                                                                                   | 33.3                                                                              |                                                                                   |                                                                                   | 31.6                                                                              |                                                                                     |                                                                                     |                                                                                     |
| Approach LOS                   | D                                                                                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                     |                                                                                     |                                                                                     |
| Timer                          | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                   | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s       | 17.3                                                                              | 47.8                                                                              | 20.4                                                                              | 16.2                                                                              | 11.8                                                                              | 53.3                                                                              | 8.6                                                                               | 27.9                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s        | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s    | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+12.0), s | 12.0                                                                              | 37.1                                                                              | 15.1                                                                              | 10.3                                                                              | 7.2                                                                               | 37.1                                                                              | 4.8                                                                               | 5.9                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s        | 0.4                                                                               | 5.6                                                                               | 0.3                                                                               | 0.5                                                                               | 0.2                                                                               | 5.7                                                                               | 0.1                                                                               | 0.4                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay            | 36.8                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 4: Honoapiilani Highway & Lower Honoapiilani Road

10/05/2017

|                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                              |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)       | 80                                                                                | 10                                                                                | 595                                                                               | 10                                                                                | 0                                                                                 | 5                                                                                 | 410                                                                               | 875                                                                               | 5                                                                                 | 0                                                                                   | 950                                                                                 | 70                                                                                  |
| Future Volume (veh/h)        | 80                                                                                | 10                                                                                | 595                                                                               | 10                                                                                | 0                                                                                 | 5                                                                                 | 410                                                                               | 875                                                                               | 5                                                                                 | 0                                                                                   | 950                                                                                 | 70                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 87                                                                                | 11                                                                                | 0                                                                                 | 11                                                                                | 0                                                                                 | 1                                                                                 | 446                                                                               | 951                                                                               | 5                                                                                 | 0                                                                                   | 1033                                                                                | 40                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 200                                                                               | 14                                                                                | 135                                                                               | 215                                                                               | 3                                                                                 | 12                                                                                | 499                                                                               | 2784                                                                              | 15                                                                                | 2                                                                                   | 1550                                                                                | 691                                                                                 |
| Arrive On Green              | 0.10                                                                              | 0.09                                                                              | 0.00                                                                              | 0.10                                                                              | 0.00                                                                              | 0.09                                                                              | 0.28                                                                              | 0.77                                                                              | 0.77                                                                              | 0.00                                                                                | 0.44                                                                                | 0.44                                                                                |
| Sat Flow, veh/h              | 1302                                                                              | 165                                                                               | 1583                                                                              | 1464                                                                              | 41                                                                                | 137                                                                               | 1774                                                                              | 3610                                                                              | 19                                                                                | 1774                                                                                | 3539                                                                                | 1578                                                                                |
| Grp Volume(v), veh/h         | 98                                                                                | 0                                                                                 | 0                                                                                 | 12                                                                                | 0                                                                                 | 0                                                                                 | 446                                                                               | 466                                                                               | 490                                                                               | 0                                                                                   | 1033                                                                                | 40                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1467                                                                              | 0                                                                                 | 1583                                                                              | 1642                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                              | 1770                                                                              | 1859                                                                              | 1774                                                                                | 1770                                                                                | 1578                                                                                |
| Q Serve(g_s), s              | 4.4                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 18.5                                                                              | 6.3                                                                               | 6.3                                                                               | 0.0                                                                                 | 17.7                                                                                | 1.1                                                                                 |
| Cycle Q Clear(g_c), s        | 4.9                                                                               | 0.0                                                                               | 0.0                                                                               | 0.5                                                                               | 0.0                                                                               | 0.0                                                                               | 18.5                                                                              | 6.3                                                                               | 6.3                                                                               | 0.0                                                                                 | 17.7                                                                                | 1.1                                                                                 |
| Prop In Lane                 | 0.89                                                                              |                                                                                   | 1.00                                                                              | 0.92                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                              |                                                                                   | 0.01                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 233                                                                               | 0                                                                                 | 135                                                                               | 251                                                                               | 0                                                                                 | 0                                                                                 | 499                                                                               | 1365                                                                              | 1434                                                                              | 2                                                                                   | 1550                                                                                | 691                                                                                 |
| V/C Ratio(X)                 | 0.42                                                                              | 0.00                                                                              | 0.00                                                                              | 0.05                                                                              | 0.00                                                                              | 0.00                                                                              | 0.89                                                                              | 0.34                                                                              | 0.34                                                                              | 0.00                                                                                | 0.67                                                                                | 0.06                                                                                |
| Avail Cap(c_a), veh/h        | 676                                                                               | 0                                                                                 | 620                                                                               | 628                                                                               | 0                                                                                 | 0                                                                                 | 1644                                                                              | 1365                                                                              | 1434                                                                              | 1644                                                                                | 2633                                                                                | 1174                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 33.8                                                                              | 0.0                                                                               | 0.0                                                                               | 31.9                                                                              | 0.0                                                                               | 0.0                                                                               | 26.4                                                                              | 2.7                                                                               | 2.7                                                                               | 0.0                                                                                 | 17.1                                                                                | 12.4                                                                                |
| Incr Delay (d2), s/veh       | 1.2                                                                               | 0.0                                                                               | 0.0                                                                               | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 2.3                                                                               | 0.3                                                                               | 0.3                                                                               | 0.0                                                                                 | 1.1                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 2.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 9.4                                                                               | 3.1                                                                               | 3.2                                                                               | 0.0                                                                                 | 8.8                                                                                 | 0.5                                                                                 |
| LnGrp Delay(d),s/veh         | 35.0                                                                              | 0.0                                                                               | 0.0                                                                               | 31.9                                                                              | 0.0                                                                               | 0.0                                                                               | 28.8                                                                              | 3.0                                                                               | 3.0                                                                               | 0.0                                                                                 | 18.2                                                                                | 12.5                                                                                |
| LnGrp LOS                    | D                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 | A                                                                                 | A                                                                                 |                                                                                     | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          | 98                                                                                |                                                                                   |                                                                                   |                                                                                   | 12                                                                                |                                                                                   | 1402                                                                              |                                                                                   |                                                                                   |                                                                                     | 1073                                                                                |                                                                                     |
| Approach Delay, s/veh        | 35.0                                                                              |                                                                                   |                                                                                   |                                                                                   | 31.9                                                                              |                                                                                   | 11.2                                                                              |                                                                                   |                                                                                   |                                                                                     | 17.9                                                                                |                                                                                     |
| Approach LOS                 | D                                                                                 |                                                                                   |                                                                                   |                                                                                   | C                                                                                 |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 25.5                                                                              | 39.5                                                                              |                                                                                   |                                                                                   | 11.5                                                                              | 0.0                                                                               | 65.1                                                                              | 11.5                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 6.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 1.0                                                                               | 57.0                                                                              |                                                                                   |                                                                                   | 27.0                                                                              | 71.0                                                                              | 57.0                                                                              | 30.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+20), s | 2.5                                                                               | 19.7                                                                              |                                                                                   |                                                                                   | 2.5                                                                               | 0.0                                                                               | 8.3                                                                               | 6.9                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 1.0                                                                               | 13.8                                                                              |                                                                                   |                                                                                   | 0.0                                                                               | 0.0                                                                               | 11.6                                                                              | 0.3                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 15.0                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 5: Honoapiilani Highway & Halawai Drive

10/05/2017

|                              |                                                                                                                                                                       |             |             |      |             |      |             |             |      |             |             |             |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|------|-------------|------|-------------|-------------|------|-------------|-------------|-------------|
|                              | <div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div></div> |             |             |      |             |      |             |             |      |             |             |             |
| Movement                     | EBL                                                                                                                                                                   | EBT         | EBR         | WBL  | WBT         | WBR  | NBL         | NBT         | NBR  | SBL         | SBT         | SBR         |
| Lane Configurations          |                                                                                                                                                                       | <div></div> | <div></div> |      | <div></div> |      | <div></div> | <div></div> |      | <div></div> | <div></div> | <div></div> |
| Traffic Volume (veh/h)       | 65                                                                                                                                                                    | 5           | 145         | 15   | 5           | 15   | 105         | 1220        | 20   | 10          | 1500        | 70          |
| Future Volume (veh/h)        | 65                                                                                                                                                                    | 5           | 145         | 15   | 5           | 15   | 105         | 1220        | 20   | 10          | 1500        | 70          |
| Number                       | 3                                                                                                                                                                     | 8           | 18          | 7    | 4           | 14   | 1           | 6           | 16   | 5           | 2           | 12          |
| Initial Q (Qb), veh          | 0                                                                                                                                                                     | 0           | 0           | 0    | 0           | 0    | 0           | 0           | 0    | 0           | 0           | 0           |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                                                                                                                  |             | 0.98        | 0.98 |             | 0.98 | 1.00        |             | 1.00 | 1.00        |             | 1.00        |
| Parking Bus, Adj             | 1.00                                                                                                                                                                  | 1.00        | 1.00        | 1.00 | 1.00        | 1.00 | 1.00        | 1.00        | 1.00 | 1.00        | 1.00        | 1.00        |
| Adj Sat Flow, veh/h/ln       | 1900                                                                                                                                                                  | 1863        | 1863        | 1900 | 1863        | 1900 | 1863        | 1863        | 1900 | 1863        | 1863        | 1863        |
| Adj Flow Rate, veh/h         | 71                                                                                                                                                                    | 5           | 5           | 16   | 5           | 1    | 114         | 1326        | 21   | 11          | 1630        | 47          |
| Adj No. of Lanes             | 0                                                                                                                                                                     | 1           | 1           | 0    | 1           | 0    | 1           | 2           | 0    | 1           | 2           | 1           |
| Peak Hour Factor             | 0.92                                                                                                                                                                  | 0.92        | 0.92        | 0.92 | 0.92        | 0.92 | 0.92        | 0.92        | 0.92 | 0.92        | 0.92        | 0.92        |
| Percent Heavy Veh, %         | 2                                                                                                                                                                     | 2           | 2           | 2    | 2           | 2    | 2           | 2           | 2    | 2           | 2           | 2           |
| Cap, veh/h                   | 213                                                                                                                                                                   | 12          | 142         | 133  | 33          | 4    | 145         | 2620        | 41   | 14          | 2341        | 1045        |
| Arrive On Green              | 0.10                                                                                                                                                                  | 0.09        | 0.09        | 0.10 | 0.09        | 0.09 | 0.08        | 0.73        | 0.73 | 0.01        | 0.66        | 0.66        |
| Sat Flow, veh/h              | 1423                                                                                                                                                                  | 130         | 1547        | 652  | 353         | 48   | 1774        | 3566        | 56   | 1774        | 3539        | 1580        |
| Grp Volume(v), veh/h         | 76                                                                                                                                                                    | 0           | 5           | 22   | 0           | 0    | 114         | 658         | 689  | 11          | 1630        | 47          |
| Grp Sat Flow(s),veh/h/ln     | 1553                                                                                                                                                                  | 0           | 1547        | 1054 | 0           | 0    | 1774        | 1770        | 1853 | 1774        | 1770        | 1580        |
| Q Serve(g_s), s              | 0.0                                                                                                                                                                   | 0.0         | 0.2         | 0.3  | 0.0         | 0.0  | 5.3         | 13.3        | 13.3 | 0.5         | 24.5        | 0.9         |
| Cycle Q Clear(g_c), s        | 3.4                                                                                                                                                                   | 0.0         | 0.2         | 3.7  | 0.0         | 0.0  | 5.3         | 13.3        | 13.3 | 0.5         | 24.5        | 0.9         |
| Prop In Lane                 | 0.93                                                                                                                                                                  |             | 1.00        | 0.73 |             | 0.05 | 1.00        |             | 0.03 | 1.00        |             | 1.00        |
| Lane Grp Cap(c), veh/h       | 243                                                                                                                                                                   | 0           | 142         | 183  | 0           | 0    | 145         | 1300        | 1361 | 14          | 2341        | 1045        |
| V/C Ratio(X)                 | 0.31                                                                                                                                                                  | 0.00        | 0.04        | 0.12 | 0.00        | 0.00 | 0.79        | 0.51        | 0.51 | 0.77        | 0.70        | 0.04        |
| Avail Cap(c_a), veh/h        | 495                                                                                                                                                                   | 0           | 420         | 446  | 0           | 0    | 439         | 1794        | 1879 | 230         | 3172        | 1416        |
| HCM Platoon Ratio            | 1.00                                                                                                                                                                  | 1.00        | 1.00        | 1.00 | 1.00        | 1.00 | 1.00        | 1.00        | 1.00 | 1.00        | 1.00        | 1.00        |
| Upstream Filter(I)           | 1.00                                                                                                                                                                  | 0.00        | 1.00        | 1.00 | 0.00        | 0.00 | 1.00        | 1.00        | 1.00 | 1.00        | 1.00        | 1.00        |
| Uniform Delay (d), s/veh     | 36.1                                                                                                                                                                  | 0.0         | 35.1        | 35.5 | 0.0         | 0.0  | 38.2        | 4.7         | 4.7  | 42.0        | 9.0         | 5.0         |
| Incr Delay (d2), s/veh       | 0.3                                                                                                                                                                   | 0.0         | 0.0         | 0.1  | 0.0         | 0.0  | 3.6         | 0.7         | 0.6  | 26.5        | 0.8         | 0.0         |
| Initial Q Delay(d3),s/veh    | 0.0                                                                                                                                                                   | 0.0         | 0.0         | 0.0  | 0.0         | 0.0  | 0.0         | 0.0         | 0.0  | 0.0         | 0.0         | 0.0         |
| %ile BackOfQ(50%),veh/ln     | 1.7                                                                                                                                                                   | 0.0         | 0.1         | 0.5  | 0.0         | 0.0  | 2.8         | 6.6         | 6.9  | 0.4         | 12.0        | 0.4         |
| LnGrp Delay(d),s/veh         | 36.3                                                                                                                                                                  | 0.0         | 35.1        | 35.7 | 0.0         | 0.0  | 41.8        | 5.4         | 5.4  | 68.5        | 9.8         | 5.0         |
| LnGrp LOS                    | D                                                                                                                                                                     |             | D           | D    |             |      | D           | A           | A    | E           | A           | A           |
| Approach Vol, veh/h          | 81                                                                                                                                                                    |             |             |      |             | 22   | 1461        |             |      | 1688        |             |             |
| Approach Delay, s/veh        | 36.3                                                                                                                                                                  |             |             |      |             | 35.7 | 8.2         |             |      | 10.1        |             |             |
| Approach LOS                 | D                                                                                                                                                                     |             |             |      |             | D    | A           |             |      | B           |             |             |
| Timer                        | 1                                                                                                                                                                     | 2           | 3           | 4    | 5           | 6    | 7           | 8           |      |             |             |             |
| Assigned Phs                 | 1                                                                                                                                                                     | 2           | 4           |      | 5           | 6    | 8           |             |      |             |             |             |
| Phs Duration (G+Y+Rc), s     | 10.9                                                                                                                                                                  | 61.1        | 12.8        |      | 4.7         | 67.3 | 12.8        |             |      |             |             |             |
| Change Period (Y+Rc), s      | 4.0                                                                                                                                                                   | 5.0         | 5.0         |      | 4.0         | 5.0  | 5.0         |             |      |             |             |             |
| Max Green Setting (Gmax), s  | 21.0                                                                                                                                                                  | 76.0        | 23.0        |      | 11.0        | 86.0 | 23.0        |             |      |             |             |             |
| Max Q Clear Time (g_c+17, s) | 17.3                                                                                                                                                                  | 26.5        | 5.7         |      | 2.5         | 15.3 | 5.4         |             |      |             |             |             |
| Green Ext Time (p_c), s      | 0.1                                                                                                                                                                   | 29.6        | 0.0         |      | 0.0         | 22.6 | 0.1         |             |      |             |             |             |
| Intersection Summary         |                                                                                                                                                                       |             |             |      |             |      |             |             |      |             |             |             |
| HCM 2010 Ctrl Delay          |                                                                                                                                                                       |             | 10.1        |      |             |      |             |             |      |             |             |             |
| HCM 2010 LOS                 |                                                                                                                                                                       |             | B           |      |             |      |             |             |      |             |             |             |



# HCM 2010 Signalized Intersection Summary

## 6: Honoapiilani Highway & Kai Ala Drive/Puukolii Road

10/05/2017

|                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-----------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                             |  |  |  |  |  |  |  |  |  |   |  |  |
| Movement                    | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations         |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)      | 75                                                                                | 5                                                                                 | 180                                                                               | 45                                                                                | 5                                                                                 | 40                                                                                | 110                                                                               | 1270                                                                              | 50                                                                                | 35                                                                                  | 1565                                                                                | 85                                                                                  |
| Future Volume (veh/h)       | 75                                                                                | 5                                                                                 | 180                                                                               | 45                                                                                | 5                                                                                 | 40                                                                                | 110                                                                               | 1270                                                                              | 50                                                                                | 35                                                                                  | 1565                                                                                | 85                                                                                  |
| Number                      | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh         | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)         | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln      | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h        | 82                                                                                | 5                                                                                 | 12                                                                                | 49                                                                                | 5                                                                                 | 3                                                                                 | 120                                                                               | 1380                                                                              | 34                                                                                | 38                                                                                  | 1701                                                                                | 53                                                                                  |
| Adj No. of Lanes            | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 1                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor            | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %        | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                  | 259                                                                               | 13                                                                                | 219                                                                               | 193                                                                               | 151                                                                               | 91                                                                                | 153                                                                               | 2330                                                                              | 1042                                                                              | 61                                                                                  | 2147                                                                                | 960                                                                                 |
| Arrive On Green             | 0.15                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.09                                                                              | 0.66                                                                              | 0.66                                                                              | 0.03                                                                                | 0.61                                                                                | 0.61                                                                                |
| Sat Flow, veh/h             | 1300                                                                              | 96                                                                                | 1576                                                                              | 1386                                                                              | 1090                                                                              | 654                                                                               | 1774                                                                              | 3539                                                                              | 1583                                                                              | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h        | 87                                                                                | 0                                                                                 | 12                                                                                | 49                                                                                | 0                                                                                 | 8                                                                                 | 120                                                                               | 1380                                                                              | 34                                                                                | 38                                                                                  | 1701                                                                                | 53                                                                                  |
| Grp Sat Flow(s),veh/h/ln    | 1396                                                                              | 0                                                                                 | 1576                                                                              | 1386                                                                              | 0                                                                                 | 1744                                                                              | 1774                                                                              | 1770                                                                              | 1583                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s             | 4.8                                                                               | 0.0                                                                               | 0.6                                                                               | 3.0                                                                               | 0.0                                                                               | 0.4                                                                               | 5.9                                                                               | 19.4                                                                              | 0.7                                                                               | 1.9                                                                                 | 32.4                                                                                | 1.2                                                                                 |
| Cycle Q Clear(g_c), s       | 5.2                                                                               | 0.0                                                                               | 0.6                                                                               | 8.2                                                                               | 0.0                                                                               | 0.4                                                                               | 5.9                                                                               | 19.4                                                                              | 0.7                                                                               | 1.9                                                                                 | 32.4                                                                                | 1.2                                                                                 |
| Prop In Lane                | 0.94                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.38                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h      | 288                                                                               | 0                                                                                 | 219                                                                               | 193                                                                               | 0                                                                                 | 242                                                                               | 153                                                                               | 2330                                                                              | 1042                                                                              | 61                                                                                  | 2147                                                                                | 960                                                                                 |
| V/C Ratio(X)                | 0.30                                                                              | 0.00                                                                              | 0.05                                                                              | 0.25                                                                              | 0.00                                                                              | 0.03                                                                              | 0.79                                                                              | 0.59                                                                              | 0.03                                                                              | 0.63                                                                                | 0.79                                                                                | 0.06                                                                                |
| Avail Cap(c_a), veh/h       | 474                                                                               | 0                                                                                 | 425                                                                               | 374                                                                               | 0                                                                                 | 471                                                                               | 419                                                                               | 2745                                                                              | 1228                                                                              | 239                                                                                 | 2387                                                                                | 1068                                                                                |
| HCM Platoon Ratio           | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)          | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh    | 34.9                                                                              | 0.0                                                                               | 33.2                                                                              | 39.0                                                                              | 0.0                                                                               | 33.1                                                                              | 39.9                                                                              | 8.5                                                                               | 5.3                                                                               | 42.4                                                                                | 13.3                                                                                | 7.1                                                                                 |
| Incr Delay (d2), s/veh      | 0.6                                                                               | 0.0                                                                               | 0.1                                                                               | 0.7                                                                               | 0.0                                                                               | 0.1                                                                               | 3.4                                                                               | 0.5                                                                               | 0.0                                                                               | 3.9                                                                                 | 2.2                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh   | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln    | 2.0                                                                               | 0.0                                                                               | 0.3                                                                               | 1.2                                                                               | 0.0                                                                               | 0.2                                                                               | 3.0                                                                               | 9.6                                                                               | 0.3                                                                               | 1.0                                                                                 | 16.2                                                                                | 0.5                                                                                 |
| LnGrp Delay(d),s/veh        | 35.4                                                                              | 0.0                                                                               | 33.3                                                                              | 39.6                                                                              | 0.0                                                                               | 33.2                                                                              | 43.2                                                                              | 9.0                                                                               | 5.3                                                                               | 46.3                                                                                | 15.4                                                                                | 7.2                                                                                 |
| LnGrp LOS                   | D                                                                                 |                                                                                   | C                                                                                 | D                                                                                 |                                                                                   | C                                                                                 | D                                                                                 | A                                                                                 | A                                                                                 | D                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h         |                                                                                   | 99                                                                                |                                                                                   |                                                                                   | 57                                                                                |                                                                                   |                                                                                   | 1534                                                                              |                                                                                   |                                                                                     | 1792                                                                                |                                                                                     |
| Approach Delay, s/veh       |                                                                                   | 35.2                                                                              |                                                                                   |                                                                                   | 38.7                                                                              |                                                                                   |                                                                                   | 11.6                                                                              |                                                                                   |                                                                                     | 15.8                                                                                |                                                                                     |
| Approach LOS                |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |
| Timer                       | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s    | 11.6                                                                              | 60.0                                                                              |                                                                                   | 17.3                                                                              | 7.0                                                                               | 64.6                                                                              |                                                                                   | 17.3                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s     | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s | 21.0                                                                              | 60.0                                                                              |                                                                                   | 24.0                                                                              | 12.0                                                                              | 69.0                                                                              |                                                                                   | 24.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I), s | 17.5                                                                              | 34.4                                                                              |                                                                                   | 10.2                                                                              | 3.9                                                                               | 21.4                                                                              |                                                                                   | 7.2                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s     | 0.2                                                                               | 19.6                                                                              |                                                                                   | 0.1                                                                               | 0.0                                                                               | 22.7                                                                              |                                                                                   | 0.3                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay         | 14.9                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 7: Honoapiilani Highway & Kaanapali Parkway/Halelo Street

10/05/2017

|                               |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)        | 280                                                                               | 5                                                                                 | 445                                                                               | 15                                                                                | 5                                                                                 | 20                                                                                | 290                                                                               | 1345                                                                              | 15                                                                                | 60                                                                                  | 1530                                                                                | 170                                                                                 |
| Future Volume (veh/h)         | 280                                                                               | 5                                                                                 | 445                                                                               | 15                                                                                | 5                                                                                 | 20                                                                                | 290                                                                               | 1345                                                                              | 15                                                                                | 60                                                                                  | 1530                                                                                | 170                                                                                 |
| Number                        | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 308                                                                               | 0                                                                                 | 271                                                                               | 16                                                                                | 5                                                                                 | 7                                                                                 | 315                                                                               | 1462                                                                              | 16                                                                                | 65                                                                                  | 1663                                                                                | 156                                                                                 |
| Adj No. of Lanes              | 2                                                                                 | 0                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 2                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 460                                                                               | 0                                                                                 | 776                                                                               | 44                                                                                | 14                                                                                | 19                                                                                | 421                                                                               | 2332                                                                              | 26                                                                                | 113                                                                                 | 2094                                                                                | 1131                                                                                |
| Arrive On Green               | 0.13                                                                              | 0.00                                                                              | 0.12                                                                              | 0.04                                                                              | 0.04                                                                              | 0.02                                                                              | 0.12                                                                              | 0.65                                                                              | 0.64                                                                              | 0.06                                                                                | 0.59                                                                                | 0.59                                                                                |
| Sat Flow, veh/h               | 3548                                                                              | 0                                                                                 | 3167                                                                              | 992                                                                               | 310                                                                               | 434                                                                               | 3442                                                                              | 3586                                                                              | 39                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h          | 308                                                                               | 0                                                                                 | 271                                                                               | 28                                                                                | 0                                                                                 | 0                                                                                 | 315                                                                               | 721                                                                               | 757                                                                               | 65                                                                                  | 1663                                                                                | 156                                                                                 |
| Grp Sat Flow(s),veh/h/ln      | 1774                                                                              | 0                                                                                 | 1583                                                                              | 1737                                                                              | 0                                                                                 | 0                                                                                 | 1721                                                                              | 1770                                                                              | 1856                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s               | 11.8                                                                              | 0.0                                                                               | 10.1                                                                              | 2.2                                                                               | 0.0                                                                               | 0.0                                                                               | 12.6                                                                              | 34.4                                                                              | 34.5                                                                              | 5.1                                                                                 | 51.8                                                                                | 4.5                                                                                 |
| Cycle Q Clear(g_c), s         | 11.8                                                                              | 0.0                                                                               | 10.1                                                                              | 2.2                                                                               | 0.0                                                                               | 0.0                                                                               | 12.6                                                                              | 34.4                                                                              | 34.5                                                                              | 5.1                                                                                 | 51.8                                                                                | 4.5                                                                                 |
| Prop In Lane                  | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.57                                                                              |                                                                                   | 0.25                                                                              | 1.00                                                                              |                                                                                   | 0.02                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 460                                                                               | 0                                                                                 | 776                                                                               | 77                                                                                | 0                                                                                 | 0                                                                                 | 421                                                                               | 1151                                                                              | 1207                                                                              | 113                                                                                 | 2094                                                                                | 1131                                                                                |
| V/C Ratio(X)                  | 0.67                                                                              | 0.00                                                                              | 0.35                                                                              | 0.36                                                                              | 0.00                                                                              | 0.00                                                                              | 0.75                                                                              | 0.63                                                                              | 0.63                                                                              | 0.57                                                                                | 0.79                                                                                | 0.14                                                                                |
| Avail Cap(c_a), veh/h         | 843                                                                               | 0                                                                                 | 1118                                                                              | 376                                                                               | 0                                                                                 | 0                                                                                 | 1395                                                                              | 2400                                                                              | 2517                                                                              | 186                                                                                 | 3736                                                                                | 1865                                                                                |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 59.3                                                                              | 0.0                                                                               | 44.6                                                                              | 66.8                                                                              | 0.0                                                                               | 0.0                                                                               | 60.6                                                                              | 14.8                                                                              | 14.8                                                                              | 65.1                                                                                | 22.5                                                                                | 6.5                                                                                 |
| Incr Delay (d2), s/veh        | 0.6                                                                               | 0.0                                                                               | 0.1                                                                               | 1.1                                                                               | 0.0                                                                               | 0.0                                                                               | 1.0                                                                               | 0.8                                                                               | 0.8                                                                               | 1.7                                                                                 | 1.0                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 5.9                                                                               | 0.0                                                                               | 4.5                                                                               | 1.1                                                                               | 0.0                                                                               | 0.0                                                                               | 6.1                                                                               | 16.9                                                                              | 17.7                                                                              | 2.6                                                                                 | 25.5                                                                                | 2.8                                                                                 |
| LnGrp Delay(d),s/veh          | 60.0                                                                              | 0.0                                                                               | 44.7                                                                              | 67.8                                                                              | 0.0                                                                               | 0.0                                                                               | 61.7                                                                              | 15.6                                                                              | 15.6                                                                              | 66.8                                                                                | 23.5                                                                                | 6.6                                                                                 |
| LnGrp LOS                     | E                                                                                 |                                                                                   | D                                                                                 | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 | B                                                                                 | B                                                                                 | E                                                                                   | C                                                                                   | A                                                                                   |
| Approach Vol, veh/h           | 579                                                                               |                                                                                   |                                                                                   | 28                                                                                |                                                                                   |                                                                                   | 1793                                                                              |                                                                                   |                                                                                   | 1884                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 52.8                                                                              |                                                                                   |                                                                                   | 67.8                                                                              |                                                                                   |                                                                                   | 23.7                                                                              |                                                                                   |                                                                                   | 23.6                                                                                |                                                                                     |                                                                                     |
| Approach LOS                  | D                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                   |                                                                                     |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 21.5                                                                              | 88.6                                                                              |                                                                                   | 10.4                                                                              | 13.1                                                                              | 97.0                                                                              |                                                                                   | 22.6                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 6.0                                                                               | 6.0                                                                               |                                                                                   | 7.0                                                                               | 6.0                                                                               | 6.0                                                                               |                                                                                   | 7.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 50.0                                                                              | 149.0                                                                             |                                                                                   | 28.0                                                                              | 13.0                                                                              | 192.0                                                                             |                                                                                   | 31.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.4), s | 14.6                                                                              | 53.8                                                                              |                                                                                   | 4.2                                                                               | 7.1                                                                               | 36.5                                                                              |                                                                                   | 13.8                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.9                                                                               | 28.9                                                                              |                                                                                   | 0.0                                                                               | 0.0                                                                               | 17.4                                                                              |                                                                                   | 1.7                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           | 27.9                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 8: Honoapiilani Highway & Leialii Parkway

10/05/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |
| Traffic Volume (veh/h)        | 5                                                                                 | 0                                                                                 | 5                                                                                 | 135                                                                               | 5                                                                                 | 70                                                                                | 5                                                                                 | 1515                                                                              | 90                                                                                | 95                                                                                  | 1950                                                                                | 10                                                                                  |
| Future Volume (veh/h)         | 5                                                                                 | 0                                                                                 | 5                                                                                 | 135                                                                               | 5                                                                                 | 70                                                                                | 5                                                                                 | 1515                                                                              | 90                                                                                | 95                                                                                  | 1950                                                                                | 10                                                                                  |
| Number                        | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h          | 5                                                                                 | 0                                                                                 | 1                                                                                 | 147                                                                               | 5                                                                                 | 5                                                                                 | 5                                                                                 | 1647                                                                              | 95                                                                                | 103                                                                                 | 2120                                                                                | 11                                                                                  |
| Adj No. of Lanes              | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 194                                                                               | 5                                                                                 | 30                                                                                | 234                                                                               | 107                                                                               | 107                                                                               | 11                                                                                | 2414                                                                              | 138                                                                               | 129                                                                                 | 2801                                                                                | 15                                                                                  |
| Arrive On Green               | 0.13                                                                              | 0.00                                                                              | 0.12                                                                              | 0.13                                                                              | 0.13                                                                              | 0.12                                                                              | 0.01                                                                              | 0.94                                                                              | 0.93                                                                              | 0.07                                                                                | 0.78                                                                                | 0.77                                                                                |
| Sat Flow, veh/h               | 1140                                                                              | 37                                                                                | 235                                                                               | 1410                                                                              | 856                                                                               | 856                                                                               | 1774                                                                              | 3403                                                                              | 195                                                                               | 1774                                                                                | 3610                                                                                | 19                                                                                  |
| Grp Volume(v), veh/h          | 6                                                                                 | 0                                                                                 | 0                                                                                 | 147                                                                               | 0                                                                                 | 10                                                                                | 5                                                                                 | 852                                                                               | 890                                                                               | 103                                                                                 | 1038                                                                                | 1093                                                                                |
| Grp Sat Flow(s),veh/h/ln      | 1412                                                                              | 0                                                                                 | 0                                                                                 | 1410                                                                              | 0                                                                                 | 1712                                                                              | 1774                                                                              | 1770                                                                              | 1828                                                                              | 1774                                                                                | 1770                                                                                | 1859                                                                                |
| Q Serve(g_s), s               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 12.4                                                                              | 0.0                                                                               | 0.7                                                                               | 0.4                                                                               | 9.8                                                                               | 10.3                                                                              | 7.4                                                                                 | 41.4                                                                                | 41.5                                                                                |
| Cycle Q Clear(g_c), s         | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 13.0                                                                              | 0.0                                                                               | 0.7                                                                               | 0.4                                                                               | 9.8                                                                               | 10.3                                                                              | 7.4                                                                                 | 41.4                                                                                | 41.5                                                                                |
| Prop In Lane                  | 0.83                                                                              |                                                                                   | 0.17                                                                              | 1.00                                                                              |                                                                                   | 0.50                                                                              | 1.00                                                                              |                                                                                   | 0.11                                                                              | 1.00                                                                                |                                                                                     | 0.01                                                                                |
| Lane Grp Cap(c), veh/h        | 228                                                                               | 0                                                                                 | 0                                                                                 | 234                                                                               | 0                                                                                 | 215                                                                               | 11                                                                                | 1256                                                                              | 1297                                                                              | 129                                                                                 | 1373                                                                                | 1443                                                                                |
| V/C Ratio(X)                  | 0.03                                                                              | 0.00                                                                              | 0.00                                                                              | 0.63                                                                              | 0.00                                                                              | 0.05                                                                              | 0.44                                                                              | 0.68                                                                              | 0.69                                                                              | 0.80                                                                                | 0.76                                                                                | 0.76                                                                                |
| Avail Cap(c_a), veh/h         | 312                                                                               | 0                                                                                 | 0                                                                                 | 318                                                                               | 0                                                                                 | 316                                                                               | 150                                                                               | 1256                                                                              | 1297                                                                              | 150                                                                                 | 1373                                                                                | 1443                                                                                |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.33                                                                              | 1.33                                                                              | 1.33                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.76                                                                              | 0.76                                                                              | 0.76                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 50.0                                                                              | 0.0                                                                               | 0.0                                                                               | 55.3                                                                              | 0.0                                                                               | 50.2                                                                              | 64.2                                                                              | 1.3                                                                               | 1.4                                                                               | 59.3                                                                                | 7.9                                                                                 | 7.9                                                                                 |
| Incr Delay (d2), s/veh        | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 2.8                                                                               | 0.0                                                                               | 0.1                                                                               | 7.5                                                                               | 2.3                                                                               | 2.3                                                                               | 19.3                                                                                | 3.9                                                                                 | 3.8                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 5.3                                                                               | 0.0                                                                               | 0.3                                                                               | 0.2                                                                               | 4.8                                                                               | 5.4                                                                               | 4.3                                                                                 | 21.4                                                                                | 22.5                                                                                |
| LnGrp Delay(d),s/veh          | 50.0                                                                              | 0.0                                                                               | 0.0                                                                               | 58.1                                                                              | 0.0                                                                               | 50.3                                                                              | 71.7                                                                              | 3.6                                                                               | 3.6                                                                               | 78.6                                                                                | 11.8                                                                                | 11.7                                                                                |
| LnGrp LOS                     | D                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   | D                                                                                 | E                                                                                 | A                                                                                 | A                                                                                 | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h           |                                                                                   | 6                                                                                 |                                                                                   |                                                                                   | 157                                                                               |                                                                                   |                                                                                   | 1747                                                                              |                                                                                   |                                                                                     | 2234                                                                                |                                                                                     |
| Approach Delay, s/veh         |                                                                                   | 50.0                                                                              |                                                                                   |                                                                                   | 57.6                                                                              |                                                                                   |                                                                                   | 3.8                                                                               |                                                                                   |                                                                                     | 14.8                                                                                |                                                                                     |
| Approach LOS                  |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 4.8                                                                               | 104.9                                                                             |                                                                                   | 20.3                                                                              | 13.5                                                                              | 96.2                                                                              |                                                                                   | 20.3                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 1.0                                                                               | 82.0                                                                              |                                                                                   | 23.0                                                                              | 11.0                                                                              | 82.0                                                                              |                                                                                   | 23.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.0), s | 12.4                                                                              | 43.5                                                                              |                                                                                   | 15.0                                                                              | 9.4                                                                               | 12.3                                                                              |                                                                                   | 2.7                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.0                                                                               | 32.8                                                                              |                                                                                   | 0.3                                                                               | 0.0                                                                               | 37.9                                                                              |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           | 11.9                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 9: Honoapiilani Highway & Front Street/Flemming Road

10/05/2017

| Movement                      | EBL  | EBT   | EBR  | WBL  | WBT  | WBR   | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-------------------------------|------|-------|------|------|------|-------|------|------|------|------|------|------|
| Lane Configurations           |      |       |      |      |      |       |      |      |      |      |      |      |
| Traffic Volume (veh/h)        | 150  | 5     | 15   | 65   | 5    | 15    | 15   | 1440 | 15   | 10   | 1715 | 285  |
| Future Volume (veh/h)         | 150  | 5     | 15   | 65   | 5    | 15    | 15   | 1440 | 15   | 10   | 1715 | 285  |
| Number                        | 3    | 8     | 18   | 7    | 4    | 14    | 1    | 6    | 16   | 5    | 2    | 12   |
| Initial Q (Qb), veh           | 0    | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)           | 1.00 |       | 1.00 | 1.00 |      | 1.00  | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Parking Bus, Adj              | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln        | 1900 | 1863  | 1900 | 1900 | 1863 | 1900  | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h          | 163  | 5     | 14   | 71   | 5    | 9     | 16   | 1565 | 15   | 11   | 1864 | 232  |
| Adj No. of Lanes              | 0    | 1     | 0    | 0    | 1    | 0     | 1    | 2    | 0    | 1    | 2    | 1    |
| Peak Hour Factor              | 0.92 | 0.92  | 0.92 | 0.92 | 0.92 | 0.92  | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, %          | 2    | 2     | 2    | 2    | 2    | 2     | 2    | 2    | 2    | 2    | 2    | 2    |
| Cap, veh/h                    | 244  | 6     | 16   | 244  | 19   | 25    | 19   | 2719 | 26   | 13   | 2668 | 1193 |
| Arrive On Green               | 0.14 | 0.14  | 0.14 | 0.14 | 0.14 | 0.14  | 0.01 | 0.76 | 0.75 | 0.01 | 0.75 | 0.75 |
| Sat Flow, veh/h               | 1338 | 41    | 115  | 1347 | 129  | 175   | 1774 | 3592 | 34   | 1774 | 3539 | 1582 |
| Grp Volume(v), veh/h          | 182  | 0     | 0    | 85   | 0    | 0     | 16   | 771  | 809  | 11   | 1864 | 232  |
| Grp Sat Flow(s),veh/h/ln      | 1494 | 0     | 0    | 1651 | 0    | 0     | 1774 | 1770 | 1857 | 1774 | 1770 | 1582 |
| Q Serve(g_s), s               | 9.4  | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 1.2  | 24.4 | 24.4 | 0.8  | 35.6 | 5.5  |
| Cycle Q Clear(g_c), s         | 15.2 | 0.0   | 0.0  | 5.8  | 0.0  | 0.0   | 1.2  | 24.4 | 24.4 | 0.8  | 35.6 | 5.5  |
| Prop In Lane                  | 0.90 |       | 0.08 | 0.84 |      | 0.11  | 1.00 |      | 0.02 | 1.00 |      | 1.00 |
| Lane Grp Cap(c), veh/h        | 267  | 0     | 0    | 287  | 0    | 0     | 19   | 1339 | 1405 | 13   | 2668 | 1193 |
| V/C Ratio(X)                  | 0.68 | 0.00  | 0.00 | 0.30 | 0.00 | 0.00  | 0.84 | 0.58 | 0.58 | 0.82 | 0.70 | 0.19 |
| Avail Cap(c_a), veh/h         | 347  | 0     | 0    | 368  | 0    | 0     | 109  | 1339 | 1405 | 109  | 2668 | 1193 |
| HCM Platoon Ratio             | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I)            | 1.00 | 0.00  | 0.00 | 1.00 | 0.00 | 0.00  | 0.68 | 0.68 | 0.68 | 0.54 | 0.54 | 0.54 |
| Uniform Delay (d), s/veh      | 54.0 | 0.0   | 0.0  | 50.2 | 0.0  | 0.0   | 64.2 | 6.8  | 6.8  | 64.4 | 8.3  | 4.6  |
| Incr Delay (d2), s/veh        | 3.6  | 0.0   | 0.0  | 0.6  | 0.0  | 0.0   | 21.1 | 1.2  | 1.2  | 21.1 | 0.8  | 0.2  |
| Initial Q Delay(d3),s/veh     | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln      | 6.6  | 0.0   | 0.0  | 2.8  | 0.0  | 0.0   | 0.7  | 12.2 | 12.8 | 0.5  | 17.4 | 2.5  |
| LnGrp Delay(d),s/veh          | 57.6 | 0.0   | 0.0  | 50.8 | 0.0  | 0.0   | 85.3 | 8.0  | 8.0  | 85.5 | 9.2  | 4.8  |
| LnGrp LOS                     | E    |       |      | D    |      |       | F    | A    | A    | F    | A    | A    |
| Approach Vol, veh/h           | 182  |       |      | 85   |      |       | 1596 |      |      | 2107 |      |      |
| Approach Delay, s/veh         | 57.6 |       |      | 50.8 |      |       | 8.8  |      |      | 9.1  |      |      |
| Approach LOS                  | E    |       |      | D    |      |       | A    |      |      | A    |      |      |
| Timer                         | 1    | 2     | 3    | 4    | 5    | 6     | 7    | 8    |      |      |      |      |
| Assigned Phs                  | 1    | 2     |      | 4    | 5    | 6     |      | 8    |      |      |      |      |
| Phs Duration (G+Y+Rc), s      | 5.4  | 102.0 |      | 22.6 | 5.0  | 102.4 |      | 22.6 |      |      |      |      |
| Change Period (Y+Rc), s       | 4.0  | 5.0   |      | 5.0  | 4.0  | 5.0   |      | 5.0  |      |      |      |      |
| Max Green Setting (Gmax), s   | 83.0 | 83.0  |      | 25.0 | 8.0  | 83.0  |      | 25.0 |      |      |      |      |
| Max Q Clear Time (g_c+1.2), s | 37.6 | 37.6  |      | 7.8  | 2.8  | 26.4  |      | 17.2 |      |      |      |      |
| Green Ext Time (p_c), s       | 0.0  | 39.8  |      | 0.2  | 0.0  | 37.3  |      | 0.4  |      |      |      |      |
| Intersection Summary          |      |       |      |      |      |       |      |      |      |      |      |      |
| HCM 2010 Ctrl Delay           |      |       | 12.1 |      |      |       |      |      |      |      |      |      |
| HCM 2010 LOS                  |      |       | B    |      |      |       |      |      |      |      |      |      |

# HCM 2010 Signalized Intersection Summary

## 10: Honoapiilani Highway & Kapunakea Street

10/05/2017



| Movement                     | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations          |      | ↕    | ↗    | ↖    | ↕    |      | ↖    | ↕↗   |      | ↖    | ↕↗   |      |
| Traffic Volume (veh/h)       | 210  | 20   | 50   | 90   | 20   | 20   | 60   | 1450 | 60   | 15   | 1715 | 140  |
| Future Volume (veh/h)        | 210  | 20   | 50   | 90   | 20   | 20   | 60   | 1450 | 60   | 15   | 1715 | 140  |
| Number                       | 3    | 8    | 18   | 7    | 4    | 14   | 1    | 6    | 16   | 5    | 2    | 12   |
| Initial Q (Qb), veh          | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)          | 1.00 |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 0.99 | 1.00 |      | 1.00 |
| Parking Bus, Adj             | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln       | 1900 | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h         | 228  | 22   | 12   | 98   | 22   | 4    | 65   | 1576 | 63   | 16   | 1864 | 148  |
| Adj No. of Lanes             | 0    | 1    | 1    | 1    | 1    | 0    | 1    | 2    | 0    | 1    | 2    | 0    |
| Peak Hour Factor             | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, %         | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |
| Cap, veh/h                   | 308  | 25   | 332  | 404  | 323  | 59   | 83   | 2381 | 95   | 19   | 2162 | 169  |
| Arrive On Green              | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.20 | 0.05 | 0.69 | 0.68 | 0.01 | 0.86 | 0.85 |
| Sat Flow, veh/h              | 1212 | 117  | 1577 | 1381 | 1533 | 279  | 1774 | 3469 | 138  | 1774 | 3325 | 261  |
| Grp Volume(v), veh/h         | 250  | 0    | 12   | 98   | 0    | 26   | 65   | 801  | 838  | 16   | 980  | 1032 |
| Grp Sat Flow(s),veh/h/ln     | 1329 | 0    | 1577 | 1381 | 0    | 1812 | 1774 | 1770 | 1837 | 1774 | 1770 | 1816 |
| Q Serve(g_s), s              | 22.5 | 0.0  | 0.8  | 0.0  | 0.0  | 1.5  | 4.7  | 33.8 | 34.2 | 1.2  | 37.0 | 41.1 |
| Cycle Q Clear(g_c), s        | 24.0 | 0.0  | 0.8  | 6.3  | 0.0  | 1.5  | 4.7  | 33.8 | 34.2 | 1.2  | 37.0 | 41.1 |
| Prop In Lane                 | 0.91 |      | 1.00 | 1.00 |      | 0.15 | 1.00 |      | 0.08 | 1.00 |      | 0.14 |
| Lane Grp Cap(c), veh/h       | 333  | 0    | 332  | 404  | 0    | 382  | 83   | 1214 | 1261 | 19   | 1151 | 1181 |
| V/C Ratio(X)                 | 0.75 | 0.00 | 0.04 | 0.24 | 0.00 | 0.07 | 0.78 | 0.66 | 0.66 | 0.84 | 0.85 | 0.87 |
| Avail Cap(c_a), veh/h        | 372  | 0    | 376  | 443  | 0    | 432  | 109  | 1214 | 1261 | 109  | 1151 | 1181 |
| HCM Platoon Ratio            | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.33 |
| Upstream Filter(I)           | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.51 | 0.51 | 0.51 | 0.62 | 0.62 | 0.62 |
| Uniform Delay (d), s/veh     | 50.7 | 0.0  | 40.8 | 43.0 | 0.0  | 41.1 | 61.3 | 11.7 | 11.8 | 64.0 | 5.6  | 5.9  |
| Incr Delay (d2), s/veh       | 7.4  | 0.0  | 0.0  | 0.3  | 0.0  | 0.1  | 9.3  | 1.4  | 1.4  | 19.7 | 5.2  | 5.9  |
| Initial Q Delay(d3),s/veh    | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln     | 0.4  | 0.0  | 0.3  | 3.0  | 0.0  | 0.8  | 2.5  | 16.7 | 17.7 | 0.7  | 18.6 | 21.3 |
| LnGrp Delay(d),s/veh         | 58.1 | 0.0  | 40.8 | 43.3 | 0.0  | 41.2 | 70.6 | 13.1 | 13.2 | 83.7 | 10.8 | 11.9 |
| LnGrp LOS                    | E    |      | D    | D    |      | D    | E    | B    | B    | F    | B    | B    |
| Approach Vol, veh/h          | 262  |      | 124  |      |      | 1704 |      |      | 2028 |      |      |      |
| Approach Delay, s/veh        | 57.3 |      | 42.9 |      |      | 15.4 |      |      | 11.9 |      |      |      |
| Approach LOS                 | E    |      | D    |      |      | B    |      |      | B    |      |      |      |
| Timer                        | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    |      |      |      |      |
| Assigned Phs                 | 1    | 2    | 4    |      | 5    | 6    | 8    |      |      |      |      |      |
| Phs Duration (G+Y+Rc), s     | 10.1 | 88.5 | 31.4 |      | 5.4  | 93.2 | 31.4 |      |      |      |      |      |
| Change Period (Y+Rc), s      | 4.0  | 5.0  | 5.0  |      | 4.0  | 5.0  | 5.0  |      |      |      |      |      |
| Max Green Setting (Gmax), s  | 78.0 | 78.0 | 30.0 |      | 8.0  | 78.0 | 30.0 |      |      |      |      |      |
| Max Q Clear Time (g_c+10), s | 43.1 | 43.1 | 8.3  |      | 3.2  | 36.2 | 26.0 |      |      |      |      |      |
| Green Ext Time (p_c), s      | 0.0  | 28.8 | 0.4  |      | 0.0  | 25.7 | 0.4  |      |      |      |      |      |
| Intersection Summary         |      |      |      |      |      |      |      |      |      |      |      |      |
| HCM 2010 Ctrl Delay          |      |      | 17.2 |      |      |      |      |      |      |      |      |      |
| HCM 2010 LOS                 |      |      | B    |      |      |      |      |      |      |      |      |      |
| Notes                        |      |      |      |      |      |      |      |      |      |      |      |      |

# HCM 2010 Signalized Intersection Summary

## 11: Honoapiilani Highway & Keawe Street

10/05/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                   |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)        | 65                                                                                | 150                                                                               | 90                                                                                | 145                                                                               | 130                                                                               | 715                                                                               | 80                                                                                | 785                                                                               | 195                                                                               | 610                                                                                 | 1015                                                                                | 105                                                                                 |
| Future Volume (veh/h)         | 65                                                                                | 150                                                                               | 90                                                                                | 145                                                                               | 130                                                                               | 715                                                                               | 80                                                                                | 785                                                                               | 195                                                                               | 610                                                                                 | 1015                                                                                | 105                                                                                 |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 0.98                                                                              |                                                                                   | 0.96                                                                              | 1.00                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h          | 71                                                                                | 163                                                                               | 11                                                                                | 158                                                                               | 141                                                                               | 392                                                                               | 87                                                                                | 853                                                                               | 125                                                                               | 663                                                                                 | 1103                                                                                | 109                                                                                 |
| Adj No. of Lanes              | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 2                                                                                 | 1                                                                                 | 2                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 107                                                                               | 192                                                                               | 281                                                                               | 250                                                                               | 576                                                                               | 477                                                                               | 110                                                                               | 1354                                                                              | 597                                                                               | 743                                                                                 | 1746                                                                                | 172                                                                                 |
| Arrive On Green               | 0.19                                                                              | 0.19                                                                              | 0.19                                                                              | 0.09                                                                              | 0.31                                                                              | 0.31                                                                              | 0.06                                                                              | 0.38                                                                              | 0.38                                                                              | 0.14                                                                                | 0.36                                                                                | 0.35                                                                                |
| Sat Flow, veh/h               | 379                                                                               | 1032                                                                              | 1514                                                                              | 1774                                                                              | 1863                                                                              | 1542                                                                              | 1774                                                                              | 3539                                                                              | 1561                                                                              | 3442                                                                                | 3254                                                                                | 321                                                                                 |
| Grp Volume(v), veh/h          | 234                                                                               | 0                                                                                 | 11                                                                                | 158                                                                               | 141                                                                               | 392                                                                               | 87                                                                                | 853                                                                               | 125                                                                               | 663                                                                                 | 599                                                                                 | 613                                                                                 |
| Grp Sat Flow(s),veh/h/ln      | 1411                                                                              | 0                                                                                 | 1514                                                                              | 1774                                                                              | 1863                                                                              | 1542                                                                              | 1774                                                                              | 1770                                                                              | 1561                                                                              | 1721                                                                                | 1770                                                                                | 1806                                                                                |
| Q Serve(g_s), s               | 18.8                                                                              | 0.0                                                                               | 0.8                                                                               | 9.0                                                                               | 7.4                                                                               | 30.6                                                                              | 6.3                                                                               | 25.5                                                                              | 7.0                                                                               | 24.6                                                                                | 36.5                                                                                | 36.6                                                                                |
| Cycle Q Clear(g_c), s         | 20.9                                                                              | 0.0                                                                               | 0.8                                                                               | 9.0                                                                               | 7.4                                                                               | 30.6                                                                              | 6.3                                                                               | 25.5                                                                              | 7.0                                                                               | 24.6                                                                                | 36.5                                                                                | 36.6                                                                                |
| Prop In Lane                  | 0.30                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 0.18                                                                                |
| Lane Grp Cap(c), veh/h        | 298                                                                               | 0                                                                                 | 281                                                                               | 250                                                                               | 576                                                                               | 477                                                                               | 110                                                                               | 1354                                                                              | 597                                                                               | 743                                                                                 | 950                                                                                 | 969                                                                                 |
| V/C Ratio(X)                  | 0.78                                                                              | 0.00                                                                              | 0.04                                                                              | 0.63                                                                              | 0.24                                                                              | 0.82                                                                              | 0.79                                                                              | 0.63                                                                              | 0.21                                                                              | 0.89                                                                                | 0.63                                                                                | 0.63                                                                                |
| Avail Cap(c_a), veh/h         | 318                                                                               | 0                                                                                 | 303                                                                               | 276                                                                               | 630                                                                               | 522                                                                               | 328                                                                               | 1354                                                                              | 597                                                                               | 953                                                                                 | 950                                                                                 | 969                                                                                 |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.67                                                                                | 0.67                                                                                | 0.67                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.79                                                                              | 0.79                                                                              | 0.79                                                                              | 0.39                                                                                | 0.39                                                                                | 0.39                                                                                |
| Uniform Delay (d), s/veh      | 51.3                                                                              | 0.0                                                                               | 43.4                                                                              | 37.9                                                                              | 33.6                                                                              | 41.6                                                                              | 60.2                                                                              | 32.6                                                                              | 26.9                                                                              | 54.1                                                                                | 31.0                                                                                | 31.1                                                                                |
| Incr Delay (d2), s/veh        | 11.5                                                                              | 0.0                                                                               | 0.1                                                                               | 4.0                                                                               | 0.2                                                                               | 9.5                                                                               | 3.8                                                                               | 1.8                                                                               | 0.6                                                                               | 3.2                                                                                 | 1.2                                                                                 | 1.2                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 0.1                                                                               | 0.0                                                                               | 0.3                                                                               | 4.6                                                                               | 3.8                                                                               | 14.3                                                                              | 3.2                                                                               | 12.8                                                                              | 3.1                                                                               | 12.1                                                                                | 18.2                                                                                | 18.6                                                                                |
| LnGrp Delay(d),s/veh          | 62.8                                                                              | 0.0                                                                               | 43.5                                                                              | 41.9                                                                              | 33.8                                                                              | 51.1                                                                              | 64.0                                                                              | 34.4                                                                              | 27.6                                                                              | 57.3                                                                                | 32.2                                                                                | 32.3                                                                                |
| LnGrp LOS                     | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 | C                                                                                 | D                                                                                 | E                                                                                 | C                                                                                 | C                                                                                 | E                                                                                   | C                                                                                   | C                                                                                   |
| Approach Vol, veh/h           | 245                                                                               |                                                                                   |                                                                                   |                                                                                   | 691                                                                               |                                                                                   |                                                                                   |                                                                                   | 1065                                                                              |                                                                                     | 1875                                                                                |                                                                                     |
| Approach Delay, s/veh         | 61.9                                                                              |                                                                                   |                                                                                   |                                                                                   | 45.5                                                                              |                                                                                   |                                                                                   |                                                                                   | 36.0                                                                              |                                                                                     | 41.1                                                                                |                                                                                     |
| Approach LOS                  | E                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                     | D                                                                                   |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 12.0                                                                              | 73.8                                                                              | 16.0                                                                              | 28.2                                                                              | 32.1                                                                              | 53.7                                                                              | 44.2                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 24.0                                                                              | 49.0                                                                              | 13.0                                                                              | 25.0                                                                              | 36.0                                                                              | 37.0                                                                              | 43.0                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.0), s | 19.3                                                                              | 38.6                                                                              | 11.0                                                                              | 22.9                                                                              | 26.6                                                                              | 27.5                                                                              | 32.6                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.1                                                                               | 7.0                                                                               | 0.1                                                                               | 0.2                                                                               | 1.5                                                                               | 5.5                                                                               | 1.9                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           |                                                                                   |                                                                                   | 41.8                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

HCM 2010 TWSC  
12: RIRO Access & Honoapiilani Highway

10/05/2017

| Intersection             |        |                                                                                   |                                                                                   |                                                                                   |      |                                                                                     |
|--------------------------|--------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh         | 0.9    |                                                                                   |                                                                                   |                                                                                   |      |                                                                                     |
| Movement                 | WBL    | WBR                                                                               | NBT                                                                               | NBR                                                                               | SBL  | SBT                                                                                 |
| Lane Configurations      |        |  |  |  |      |  |
| Traffic Vol, veh/h       | 0      | 95                                                                                | 670                                                                               | 110                                                                               | 0    | 885                                                                                 |
| Future Vol, veh/h        | 0      | 95                                                                                | 670                                                                               | 110                                                                               | 0    | 885                                                                                 |
| Conflicting Peds, #/hr   | 0      | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   |
| Sign Control             | Stop   | Stop                                                                              | Free                                                                              | Free                                                                              | Free | Free                                                                                |
| RT Channelized           | -      | None                                                                              | -                                                                                 | None                                                                              | -    | None                                                                                |
| Storage Length           | -      | 0                                                                                 | -                                                                                 | 0                                                                                 | -    | -                                                                                   |
| Veh in Median Storage, # | 0      | -                                                                                 | 0                                                                                 | -                                                                                 | -    | 0                                                                                   |
| Grade, %                 | 0      | -                                                                                 | 0                                                                                 | -                                                                                 | -    | 0                                                                                   |
| Peak Hour Factor         | 92     | 92                                                                                | 92                                                                                | 92                                                                                | 92   | 92                                                                                  |
| Heavy Vehicles, %        | 2      | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                   |
| Mvmt Flow                | 0      | 103                                                                               | 728                                                                               | 120                                                                               | 0    | 962                                                                                 |
| Major/Minor              | Minor1 | Major1                                                                            |                                                                                   | Major2                                                                            |      |                                                                                     |
| Conflicting Flow All     | -      | 728                                                                               | 0                                                                                 | 0                                                                                 | -    | -                                                                                   |
| Stage 1                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Stage 2                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Critical Hdwy            | -      | 6.22                                                                              | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Critical Hdwy Stg 1      | -      | -                                                                                 | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Critical Hdwy Stg 2      | -      | -                                                                                 | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Follow-up Hdwy           | -      | 3.318                                                                             | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Pot Cap-1 Maneuver       | 0      | 423                                                                               | -                                                                                 | -                                                                                 | 0    | -                                                                                   |
| Stage 1                  | 0      | -                                                                                 | -                                                                                 | -                                                                                 | 0    | -                                                                                   |
| Stage 2                  | 0      | -                                                                                 | -                                                                                 | -                                                                                 | 0    | -                                                                                   |
| Platoon blocked, %       |        |                                                                                   | -                                                                                 | -                                                                                 |      | -                                                                                   |
| Mov Cap-1 Maneuver       | -      | 423                                                                               | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Mov Cap-2 Maneuver       | -      | -                                                                                 | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Stage 1                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Stage 2                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -    | -                                                                                   |
| Approach                 | WB     | NB                                                                                |                                                                                   | SB                                                                                |      |                                                                                     |
| HCM Control Delay, s     | 16.2   | 0                                                                                 |                                                                                   | 0                                                                                 |      |                                                                                     |
| HCM LOS                  | C      |                                                                                   |                                                                                   |                                                                                   |      |                                                                                     |
| Minor Lane/Major Mvmt    | NBT    | NBRWBLn1                                                                          | SBT                                                                               |                                                                                   |      |                                                                                     |
| Capacity (veh/h)         | -      | - 423                                                                             | -                                                                                 |                                                                                   |      |                                                                                     |
| HCM Lane V/C Ratio       | -      | - 0.244                                                                           | -                                                                                 |                                                                                   |      |                                                                                     |
| HCM Control Delay (s)    | -      | - 16.2                                                                            | -                                                                                 |                                                                                   |      |                                                                                     |
| HCM Lane LOS             | -      | - C                                                                               | -                                                                                 |                                                                                   |      |                                                                                     |
| HCM 95th %tile Q(veh)    | -      | - 0.9                                                                             | -                                                                                 |                                                                                   |      |                                                                                     |

| Intersection               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
|----------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh           | 1.7                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Movement                   | WBL                                                                               | WBR                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 |
| Lane Configurations        |  |  |  |  |  |  |
| Traffic Vol, veh/h         | 60                                                                                | 35                                                                                | 880                                                                               | 75                                                                                | 40                                                                                  | 945                                                                                 |
| Future Vol, veh/h          | 60                                                                                | 35                                                                                | 880                                                                               | 75                                                                                | 40                                                                                  | 945                                                                                 |
| Conflicting Peds, #/hr     | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   |
| Sign Control               | Stop                                                                              | Stop                                                                              | Free                                                                              | Free                                                                              | Free                                                                                | Free                                                                                |
| RT Channelized             | -                                                                                 | None                                                                              | -                                                                                 | None                                                                              | -                                                                                   | None                                                                                |
| Storage Length             | 0                                                                                 | 100                                                                               | -                                                                                 | 100                                                                               | 100                                                                                 | -                                                                                   |
| Veh in Median Storage, #   | 0                                                                                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                   | 0                                                                                   |
| Grade, %                   | 0                                                                                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                   | 0                                                                                   |
| Peak Hour Factor           | 92                                                                                | 92                                                                                | 92                                                                                | 92                                                                                | 92                                                                                  | 92                                                                                  |
| Heavy Vehicles, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   |
| Mvmt Flow                  | 65                                                                                | 38                                                                                | 957                                                                               | 82                                                                                | 43                                                                                  | 1027                                                                                |
|                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Major/Minor                | Minor1                                                                            |                                                                                   | Major1                                                                            |                                                                                   | Major2                                                                              |                                                                                     |
| Conflicting Flow All       | 2070                                                                              | 957                                                                               | 0                                                                                 | 0                                                                                 | 1039                                                                                | 0                                                                                   |
| Stage 1                    | 957                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 2                    | 1113                                                                              | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Critical Hdwy              | 6.42                                                                              | 6.22                                                                              | -                                                                                 | -                                                                                 | 4.12                                                                                | -                                                                                   |
| Critical Hdwy Stg 1        | 5.42                                                                              | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Critical Hdwy Stg 2        | 5.42                                                                              | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Follow-up Hdwy             | 3.518                                                                             | 3.318                                                                             | -                                                                                 | -                                                                                 | 2.218                                                                               | -                                                                                   |
| Pot Cap-1 Maneuver         | ~ 59                                                                              | 313                                                                               | -                                                                                 | -                                                                                 | 669                                                                                 | -                                                                                   |
| Stage 1                    | 373                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 2                    | 314                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Platoon blocked, %         |                                                                                   |                                                                                   | -                                                                                 | -                                                                                 |                                                                                     | -                                                                                   |
| Mov Cap-1 Maneuver         | ~ 55                                                                              | 313                                                                               | -                                                                                 | -                                                                                 | 669                                                                                 | -                                                                                   |
| Mov Cap-2 Maneuver         | 164                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 1                    | 349                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 2                    | 314                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
|                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Approach                   | WB                                                                                |                                                                                   | NB                                                                                |                                                                                   | SB                                                                                  |                                                                                     |
| HCM Control Delay, s       | 32.4                                                                              |                                                                                   | 0                                                                                 |                                                                                   | 0.4                                                                                 |                                                                                     |
| HCM LOS                    | D                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
|                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Minor Lane/Major Mvmt      | NBT                                                                               | NBR                                                                               | WBLn1                                                                             | WBLn2                                                                             | SBL                                                                                 | SBT                                                                                 |
| Capacity (veh/h)           | -                                                                                 | -                                                                                 | 164                                                                               | 313                                                                               | 669                                                                                 | -                                                                                   |
| HCM Lane V/C Ratio         | -                                                                                 | -                                                                                 | 0.398                                                                             | 0.122                                                                             | 0.065                                                                               | -                                                                                   |
| HCM Control Delay (s)      | -                                                                                 | -                                                                                 | 40.7                                                                              | 18.1                                                                              | 10.8                                                                                | -                                                                                   |
| HCM Lane LOS               | -                                                                                 | -                                                                                 | E                                                                                 | C                                                                                 | B                                                                                   | -                                                                                   |
| HCM 95th %tile Q(veh)      | -                                                                                 | -                                                                                 | 1.7                                                                               | 0.4                                                                               | 0.2                                                                                 | -                                                                                   |
| Notes                      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| ~: Volume exceeds capacity |                                                                                   | \$: Delay exceeds 300s                                                            |                                                                                   | +: Computation Not Defined                                                        |                                                                                     | *: All major volume in platoon                                                      |



| Intersection             |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|--------|-------------------------------------------------------------------------------------|-------|--------|-------------------------------------------------------------------------------------|-------|
| Int Delay, s/veh         | 11.1                                                                              |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Movement                 | EBL                                                                               | EBT                                                                               | EBR  | WBL                                                                               | WBT                                                                               | WBR  | NBL    | NBT                                                                                 | NBR   | SBL    | SBT                                                                                 | SBR   |
| Lane Configurations      |  |  |      |  |  |      |        |  |       |        |  |       |
| Traffic Vol, veh/h       | 190                                                                               | 105                                                                               | 125  | 5                                                                                 | 95                                                                                | 5    | 115    | 5                                                                                   | 5     | 5      | 5                                                                                   | 180   |
| Future Vol, veh/h        | 190                                                                               | 105                                                                               | 125  | 5                                                                                 | 95                                                                                | 5    | 115    | 5                                                                                   | 5     | 5      | 5                                                                                   | 180   |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0      | 0                                                                                   | 0     | 0      | 0                                                                                   | 0     |
| Sign Control             | Free                                                                              | Free                                                                              | Free | Free                                                                              | Free                                                                              | Free | Stop   | Stop                                                                                | Stop  | Stop   | Stop                                                                                | Stop  |
| RT Channelized           | -                                                                                 | -                                                                                 | None | -                                                                                 | -                                                                                 | None | -      | -                                                                                   | None  | -      | -                                                                                   | None  |
| Storage Length           | 100                                                                               | -                                                                                 | -    | 100                                                                               | -                                                                                 | -    | -      | -                                                                                   | -     | -      | -                                                                                   | -     |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | -    | -                                                                                 | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Grade, %                 | -                                                                                 | 0                                                                                 | -    | -                                                                                 | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Peak Hour Factor         | 92                                                                                | 92                                                                                | 92   | 92                                                                                | 92                                                                                | 92   | 92     | 92                                                                                  | 92    | 92     | 92                                                                                  | 92    |
| Heavy Vehicles, %        | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    | 2      | 2                                                                                   | 2     | 2      | 2                                                                                   | 2     |
| Mvmt Flow                | 207                                                                               | 114                                                                               | 136  | 5                                                                                 | 103                                                                               | 5    | 125    | 5                                                                                   | 5     | 5      | 5                                                                                   | 196   |
|                          |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Major/Minor              | Major1                                                                            |                                                                                   |      | Major2                                                                            |                                                                                   |      | Minor1 |                                                                                     |       | Minor2 |                                                                                     |       |
| Conflicting Flow All     | 108                                                                               | 0                                                                                 | 0    | 250                                                                               | 0                                                                                 | 0    | 812    | 714                                                                                 | 182   | 717    | 780                                                                                 | 106   |
| Stage 1                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 596    | 596                                                                                 | -     | 116    | 116                                                                                 | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 216    | 118                                                                                 | -     | 601    | 664                                                                                 | -     |
| Critical Hdwy            | 4.12                                                                              | -                                                                                 | -    | 4.12                                                                              | -                                                                                 | -    | 7.12   | 6.52                                                                                | 6.22  | 7.12   | 6.52                                                                                | 6.22  |
| Critical Hdwy Stg 1      | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Critical Hdwy Stg 2      | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Follow-up Hdwy           | 2.218                                                                             | -                                                                                 | -    | 2.218                                                                             | -                                                                                 | -    | 3.518  | 4.018                                                                               | 3.318 | 3.518  | 4.018                                                                               | 3.318 |
| Pot Cap-1 Maneuver       | 1483                                                                              | -                                                                                 | -    | 1316                                                                              | -                                                                                 | -    | 298    | 357                                                                                 | 861   | 345    | 327                                                                                 | 948   |
| Stage 1                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 490    | 492                                                                                 | -     | 889    | 800                                                                                 | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 786    | 798                                                                                 | -     | 487    | 458                                                                                 | -     |
| Platoon blocked, %       |                                                                                   | -                                                                                 | -    |                                                                                   | -                                                                                 | -    |        |                                                                                     |       |        |                                                                                     |       |
| Mov Cap-1 Maneuver       | 1483                                                                              | -                                                                                 | -    | 1316                                                                              | -                                                                                 | -    | 207    | 306                                                                                 | 861   | 301    | 280                                                                                 | 948   |
| Mov Cap-2 Maneuver       | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 207    | 306                                                                                 | -     | 301    | 280                                                                                 | -     |
| Stage 1                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 421    | 423                                                                                 | -     | 765    | 797                                                                                 | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 617    | 795                                                                                 | -     | 411    | 394                                                                                 | -     |
|                          |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Approach                 | EB                                                                                |                                                                                   |      | WB                                                                                |                                                                                   |      | NB     |                                                                                     |       | SB     |                                                                                     |       |
| HCM Control Delay, s     | 3.5                                                                               |                                                                                   |      | 0.4                                                                               |                                                                                   |      | 46.3   |                                                                                     |       | 10.6   |                                                                                     |       |
| HCM LOS                  |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      | E      |                                                                                     |       | B      |                                                                                     |       |
|                          |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Minor Lane/Major Mvmt    | NBLn1                                                                             | EBL                                                                               | EBT  | EBR                                                                               | WBL                                                                               | WBT  | WBR    | SBLn1                                                                               |       |        |                                                                                     |       |
| Capacity (veh/h)         | 216                                                                               | 1483                                                                              | -    | -                                                                                 | 1316                                                                              | -    | -      | 847                                                                                 |       |        |                                                                                     |       |
| HCM Lane V/C Ratio       | 0.629                                                                             | 0.139                                                                             | -    | -                                                                                 | 0.004                                                                             | -    | -      | 0.244                                                                               |       |        |                                                                                     |       |
| HCM Control Delay (s)    | 46.3                                                                              | 7.8                                                                               | -    | -                                                                                 | 7.7                                                                               | -    | -      | 10.6                                                                                |       |        |                                                                                     |       |
| HCM Lane LOS             | E                                                                                 | A                                                                                 | -    | -                                                                                 | A                                                                                 | -    | -      | B                                                                                   |       |        |                                                                                     |       |
| HCM 95th %tile O(veh)    | 3.7                                                                               | 0.5                                                                               | -    | -                                                                                 | 0                                                                                 | -    | -      | 1                                                                                   |       |        |                                                                                     |       |

| Intersection             |        |              |      |        |              |      |        |              |       |        |              |       |
|--------------------------|--------|--------------|------|--------|--------------|------|--------|--------------|-------|--------|--------------|-------|
| Int Delay, s/veh         | 4.8    |              |      |        |              |      |        |              |       |        |              |       |
| Movement                 | EBL    | EBT          | EBR  | WBL    | WBT          | WBR  | NBL    | NBT          | NBR   | SBL    | SBT          | SBR   |
| Lane Configurations      |        | <div>↕</div> |      |        | <div>↕</div> |      |        | <div>↕</div> |       |        | <div>↕</div> |       |
| Traffic Vol, veh/h       | 25     | 20           | 65   | 5      | 25           | 5    | 55     | 5            | 5     | 5      | 5            | 20    |
| Future Vol, veh/h        | 25     | 20           | 65   | 5      | 25           | 5    | 55     | 5            | 5     | 5      | 5            | 20    |
| Conflicting Peds, #/hr   | 0      | 0            | 0    | 0      | 0            | 0    | 0      | 0            | 0     | 0      | 0            | 0     |
| Sign Control             | Free   | Free         | Free | Free   | Free         | Free | Stop   | Stop         | Stop  | Stop   | Stop         | Stop  |
| RT Channelized           | -      | -            | None | -      | -            | None | -      | -            | None  | -      | -            | None  |
| Storage Length           | -      | -            | -    | -      | -            | -    | -      | -            | -     | -      | -            | -     |
| Veh in Median Storage, # | -      | 0            | -    | -      | 0            | -    | -      | 0            | -     | -      | 0            | -     |
| Grade, %                 | -      | 0            | -    | -      | 0            | -    | -      | 0            | -     | -      | 0            | -     |
| Peak Hour Factor         | 92     | 92           | 92   | 92     | 92           | 92   | 92     | 92           | 92    | 92     | 92           | 92    |
| Heavy Vehicles, %        | 2      | 2            | 2    | 2      | 2            | 2    | 2      | 2            | 2     | 2      | 2            | 2     |
| Mvmt Flow                | 27     | 22           | 71   | 5      | 27           | 5    | 60     | 5            | 5     | 5      | 5            | 22    |
|                          |        |              |      |        |              |      |        |              |       |        |              |       |
| Major/Minor              | Major1 |              |      | Major2 |              |      | Minor1 |              |       | Minor2 |              |       |
| Conflicting Flow All     | 32     | 0            | 0    | 93     | 0            | 0    | 165    | 154          | 58    | 157    | 187          | 30    |
| Stage 1                  | -      | -            | -    | -      | -            | -    | 112    | 112          | -     | 40     | 40           | -     |
| Stage 2                  | -      | -            | -    | -      | -            | -    | 53     | 42           | -     | 117    | 147          | -     |
| Critical Hdwy            | 4.12   | -            | -    | 4.12   | -            | -    | 7.12   | 6.52         | 6.22  | 7.12   | 6.52         | 6.22  |
| Critical Hdwy Stg 1      | -      | -            | -    | -      | -            | -    | 6.12   | 5.52         | -     | 6.12   | 5.52         | -     |
| Critical Hdwy Stg 2      | -      | -            | -    | -      | -            | -    | 6.12   | 5.52         | -     | 6.12   | 5.52         | -     |
| Follow-up Hdwy           | 2.218  | -            | -    | 2.218  | -            | -    | 3.518  | 4.018        | 3.318 | 3.518  | 4.018        | 3.318 |
| Pot Cap-1 Maneuver       | 1580   | -            | -    | 1501   | -            | -    | 800    | 738          | 1008  | 809    | 708          | 1044  |
| Stage 1                  | -      | -            | -    | -      | -            | -    | 893    | 803          | -     | 975    | 862          | -     |
| Stage 2                  | -      | -            | -    | -      | -            | -    | 960    | 860          | -     | 888    | 775          | -     |
| Platoon blocked, %       |        | -            | -    |        | -            | -    |        |              |       |        |              |       |
| Mov Cap-1 Maneuver       | 1580   | -            | -    | 1501   | -            | -    | 766    | 723          | 1008  | 787    | 693          | 1044  |
| Mov Cap-2 Maneuver       | -      | -            | -    | -      | -            | -    | 766    | 723          | -     | 787    | 693          |       |
| Stage 1                  | -      | -            | -    | -      | -            | -    | 877    | 789          | -     | 957    | 859          | -     |
| Stage 2                  | -      | -            | -    | -      | -            | -    | 931    | 857          | -     | 861    | 761          | -     |
|                          |        |              |      |        |              |      |        |              |       |        |              |       |
| Approach                 | EB     |              |      | WB     |              |      | NB     |              |       | SB     |              |       |
| HCM Control Delay, s     | 1.7    |              |      | 1.1    |              |      | 10.1   |              |       | 9.1    |              |       |
| HCM LOS                  |        |              |      |        |              |      | B      |              |       | A      |              |       |
|                          |        |              |      |        |              |      |        |              |       |        |              |       |
| Minor Lane/Major Mvmt    | NBLn1  | EBL          | EBT  | EBR    | WBL          | WBT  | WBR    | SBLn1        |       |        |              |       |
| Capacity (veh/h)         | 777    | 1580         | -    | -      | 1501         | -    | -      | 917          |       |        |              |       |
| HCM Lane V/C Ratio       | 0.091  | 0.017        | -    | -      | 0.004        | -    | -      | 0.036        |       |        |              |       |
| HCM Control Delay (s)    | 10.1   | 7.3          | 0    | -      | 7.4          | 0    | -      | 9.1          |       |        |              |       |
| HCM Lane LOS             | B      | A            | A    | -      | A            | A    | -      | A            |       |        |              |       |
| HCM 95th %tile O(veh)    | 0.3    | 0.1          | -    | -      | 0            | -    | -      | 0.1          |       |        |              |       |

| Intersection             |                                                                                   |      |        |                                                                                   |                                                                                     |       |
|--------------------------|-----------------------------------------------------------------------------------|------|--------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------|
| Int Delay, s/veh         | 2.1                                                                               |      |        |                                                                                   |                                                                                     |       |
| Movement                 | EBT                                                                               | EBR  | WBL    | WBT                                                                               | NBL                                                                                 | NBR   |
| Lane Configurations      |  |      |        |  |  |       |
| Traffic Vol, veh/h       | 60                                                                                | 55   | 5      | 55                                                                                | 40                                                                                  | 5     |
| Future Vol, veh/h        | 60                                                                                | 55   | 5      | 55                                                                                | 40                                                                                  | 5     |
| Conflicting Peds, #/hr   | 0                                                                                 | 0    | 0      | 0                                                                                 | 0                                                                                   | 0     |
| Sign Control             | Free                                                                              | Free | Free   | Free                                                                              | Stop                                                                                | Stop  |
| RT Channelized           | -                                                                                 | None | -      | None                                                                              | -                                                                                   | None  |
| Storage Length           | -                                                                                 | -    | -      | -                                                                                 | 0                                                                                   | -     |
| Veh in Median Storage, # | 0                                                                                 | -    | -      | 0                                                                                 | 0                                                                                   | -     |
| Grade, %                 | 0                                                                                 | -    | -      | 0                                                                                 | 0                                                                                   | -     |
| Peak Hour Factor         | 92                                                                                | 92   | 92     | 92                                                                                | 92                                                                                  | 92    |
| Heavy Vehicles, %        | 2                                                                                 | 2    | 2      | 2                                                                                 | 2                                                                                   | 2     |
| Mvmt Flow                | 65                                                                                | 60   | 5      | 60                                                                                | 43                                                                                  | 5     |
| Major/Minor              | Major1                                                                            |      | Major2 |                                                                                   | Minor1                                                                              |       |
| Conflicting Flow All     | 0                                                                                 | 0    | 125    | 0                                                                                 | 165                                                                                 | 95    |
| Stage 1                  | -                                                                                 | -    | -      | -                                                                                 | 95                                                                                  | -     |
| Stage 2                  | -                                                                                 | -    | -      | -                                                                                 | 70                                                                                  | -     |
| Critical Hdwy            | -                                                                                 | -    | 4.12   | -                                                                                 | 6.42                                                                                | 6.22  |
| Critical Hdwy Stg 1      | -                                                                                 | -    | -      | -                                                                                 | 5.42                                                                                | -     |
| Critical Hdwy Stg 2      | -                                                                                 | -    | -      | -                                                                                 | 5.42                                                                                | -     |
| Follow-up Hdwy           | -                                                                                 | -    | 2.218  | -                                                                                 | 3.518                                                                               | 3.318 |
| Pot Cap-1 Maneuver       | -                                                                                 | -    | 1462   | -                                                                                 | 826                                                                                 | 962   |
| Stage 1                  | -                                                                                 | -    | -      | -                                                                                 | 929                                                                                 | -     |
| Stage 2                  | -                                                                                 | -    | -      | -                                                                                 | 953                                                                                 | -     |
| Platoon blocked, %       | -                                                                                 | -    | -      | -                                                                                 | -                                                                                   | -     |
| Mov Cap-1 Maneuver       | -                                                                                 | -    | 1462   | -                                                                                 | 823                                                                                 | 962   |
| Mov Cap-2 Maneuver       | -                                                                                 | -    | -      | -                                                                                 | 823                                                                                 | -     |
| Stage 1                  | -                                                                                 | -    | -      | -                                                                                 | 925                                                                                 | -     |
| Stage 2                  | -                                                                                 | -    | -      | -                                                                                 | 953                                                                                 | -     |
| Approach                 | EB                                                                                |      | WB     |                                                                                   | NB                                                                                  |       |
| HCM Control Delay, s     | 0                                                                                 |      | 0.6    |                                                                                   | 9.6                                                                                 |       |
| HCM LOS                  |                                                                                   |      |        |                                                                                   | A                                                                                   |       |
| Minor Lane/Major Mvmt    | NBLn1                                                                             | EBT  | EBR    | WBL                                                                               | WBT                                                                                 |       |
| Capacity (veh/h)         | 836                                                                               | -    | -      | 1462                                                                              | -                                                                                   |       |
| HCM Lane V/C Ratio       | 0.059                                                                             | -    | -      | 0.004                                                                             | -                                                                                   |       |
| HCM Control Delay (s)    | 9.6                                                                               | -    | -      | 7.5                                                                               | 0                                                                                   |       |
| HCM Lane LOS             | A                                                                                 | -    | -      | A                                                                                 | A                                                                                   |       |
| HCM 95th %tile Q(veh)    | 0.2                                                                               | -    | -      | 0                                                                                 | -                                                                                   |       |

HCM 2010 Roundabout  
17: Road F & Road J

10/05/2017

| Intersection                |       |       |       |
|-----------------------------|-------|-------|-------|
| Intersection Delay, s/veh   | 3.7   |       |       |
| Intersection LOS            | A     |       |       |
| Approach                    | EB    | WB    | NB    |
| Entry Lanes                 | 1     | 1     | 1     |
| Conflicting Circle Lanes    | 1     | 1     | 1     |
| Adj Approach Flow, veh/h    | 71    | 38    | 32    |
| Demand Flow Rate, veh/h     | 73    | 39    | 33    |
| Vehicles Circulating, veh/h | 5     | 28    | 39    |
| Vehicles Exiting, veh/h     | 62    | 44    | 39    |
| Follow-Up Headway, s        | 3.186 | 3.186 | 3.186 |
| Ped Vol Crossing Leg, #/h   | 0     | 0     | 0     |
| Ped Cap Adj                 | 1.000 | 1.000 | 1.000 |
| Approach Delay, s/veh       | 3.8   | 3.6   | 3.7   |
| Approach LOS                | A     | A     | A     |
| Lane                        | Left  | Left  | Left  |
| Designated Moves            | TR    | LT    | LR    |
| Assumed Moves               | TR    | LT    | LR    |
| RT Channelized              |       |       |       |
| Lane Util                   | 1.000 | 1.000 | 1.000 |
| Critical Headway, s         | 5.193 | 5.193 | 5.193 |
| Entry Flow, veh/h           | 73    | 39    | 33    |
| Cap Entry Lane, veh/h       | 1124  | 1099  | 1087  |
| Entry HV Adj Factor         | 0.976 | 0.983 | 0.970 |
| Flow Entry, veh/h           | 71    | 38    | 32    |
| Cap Entry, veh/h            | 1097  | 1080  | 1054  |
| V/C Ratio                   | 0.065 | 0.035 | 0.030 |
| Control Delay, s/veh        | 3.8   | 3.6   | 3.7   |
| LOS                         | A     | A     | A     |
| 95th %tile Queue, veh       | 0     | 0     | 0     |



---

## **APPENDIX C**

### LEVEL OF SERVICE CALCULATIONS

- Future Year 2027 Scenario 4 AM Peak
-

# HCM 2010 Signalized Intersection Summary

## 1: Honoapiilani Highway & Napilihau Street

10/05/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 50                                                                                | 45                                                                                | 310                                                                               | 95                                                                                | 50                                                                                | 20                                                                                | 255                                                                                 | 290                                                                                 | 115                                                                                 | 10                                                                                  | 210                                                                                 | 30                                                                                  |
| Future Volume (veh/h)        | 50                                                                                | 45                                                                                | 310                                                                               | 95                                                                                | 50                                                                                | 20                                                                                | 255                                                                                 | 290                                                                                 | 115                                                                                 | 10                                                                                  | 210                                                                                 | 30                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.99                                                                              | 0.99                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 54                                                                                | 49                                                                                | 40                                                                                | 103                                                                               | 54                                                                                | 10                                                                                | 277                                                                                 | 315                                                                                 | 63                                                                                  | 11                                                                                  | 228                                                                                 | 9                                                                                   |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 235                                                                               | 169                                                                               | 264                                                                               | 326                                                                               | 257                                                                               | 48                                                                                | 364                                                                                 | 815                                                                                 | 693                                                                                 | 15                                                                                  | 449                                                                                 | 382                                                                                 |
| Arrive On Green              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.17                                                                              | 0.21                                                                                | 0.44                                                                                | 0.44                                                                                | 0.01                                                                                | 0.24                                                                                | 0.24                                                                                |
| Sat Flow, veh/h              | 611                                                                               | 1002                                                                              | 1569                                                                              | 1294                                                                              | 1527                                                                              | 283                                                                               | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 103                                                                               | 0                                                                                 | 40                                                                                | 103                                                                               | 0                                                                                 | 64                                                                                | 277                                                                                 | 315                                                                                 | 63                                                                                  | 11                                                                                  | 228                                                                                 | 9                                                                                   |
| Grp Sat Flow(s),veh/h/ln     | 1613                                                                              | 0                                                                                 | 1569                                                                              | 1294                                                                              | 0                                                                                 | 1810                                                                              | 1774                                                                                | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 0.4                                                                               | 0.0                                                                               | 0.9                                                                               | 3.2                                                                               | 0.0                                                                               | 1.3                                                                               | 6.1                                                                                 | 4.8                                                                                 | 1.0                                                                                 | 0.3                                                                                 | 4.4                                                                                 | 0.2                                                                                 |
| Cycle Q Clear(g_c), s        | 2.1                                                                               | 0.0                                                                               | 0.9                                                                               | 5.3                                                                               | 0.0                                                                               | 1.3                                                                               | 6.1                                                                                 | 4.8                                                                                 | 1.0                                                                                 | 0.3                                                                                 | 4.4                                                                                 | 0.2                                                                                 |
| Prop In Lane                 | 0.52                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.16                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 404                                                                               | 0                                                                                 | 264                                                                               | 326                                                                               | 0                                                                                 | 305                                                                               | 364                                                                                 | 815                                                                                 | 693                                                                                 | 15                                                                                  | 449                                                                                 | 382                                                                                 |
| V/C Ratio(X)                 | 0.26                                                                              | 0.00                                                                              | 0.15                                                                              | 0.32                                                                              | 0.00                                                                              | 0.21                                                                              | 0.76                                                                                | 0.39                                                                                | 0.09                                                                                | 0.72                                                                                | 0.51                                                                                | 0.02                                                                                |
| Avail Cap(c_a), veh/h        | 1033                                                                              | 0                                                                                 | 908                                                                               | 856                                                                               | 0                                                                                 | 1047                                                                              | 1282                                                                                | 3546                                                                                | 3014                                                                                | 641                                                                                 | 2873                                                                                | 2442                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 15.2                                                                              | 0.0                                                                               | 14.7                                                                              | 17.5                                                                              | 0.0                                                                               | 14.9                                                                              | 15.5                                                                                | 7.9                                                                                 | 6.8                                                                                 | 20.5                                                                                | 13.6                                                                                | 12.0                                                                                |
| Incr Delay (d2), s/veh       | 0.3                                                                               | 0.0                                                                               | 0.3                                                                               | 0.6                                                                               | 0.0                                                                               | 0.3                                                                               | 3.3                                                                                 | 0.6                                                                                 | 0.1                                                                                 | 47.6                                                                                | 1.9                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.1                                                                               | 0.0                                                                               | 0.4                                                                               | 1.2                                                                               | 0.0                                                                               | 0.7                                                                               | 3.3                                                                                 | 2.5                                                                                 | 0.4                                                                                 | 0.3                                                                                 | 2.5                                                                                 | 0.1                                                                                 |
| LnGrp Delay(d),s/veh         | 15.5                                                                              | 0.0                                                                               | 15.0                                                                              | 18.1                                                                              | 0.0                                                                               | 15.2                                                                              | 18.8                                                                                | 8.5                                                                                 | 7.0                                                                                 | 68.1                                                                                | 15.5                                                                                | 12.1                                                                                |
| LnGrp LOS                    | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                 |                                                                                   | B                                                                                 | B                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 143                                                                               |                                                                                   |                                                                                   | 167                                                                               |                                                                                   |                                                                                     | 655                                                                                 |                                                                                     |                                                                                     | 248                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 15.4                                                                              |                                                                                   |                                                                                   | 17.0                                                                              |                                                                                   |                                                                                     | 12.7                                                                                |                                                                                     |                                                                                     | 17.7                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.4                                                                               | 24.2                                                                              |                                                                                   | 12.0                                                                              | 13.5                                                                              | 16.0                                                                              |                                                                                     | 12.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 79.0                                                                              |                                                                                   | 24.0                                                                              | 30.0                                                                              | 64.0                                                                              |                                                                                     | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.3                                                                               | 6.8                                                                               |                                                                                   | 4.1                                                                               | 8.1                                                                               | 6.4                                                                               |                                                                                     | 7.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 4.8                                                                               |                                                                                   | 0.6                                                                               | 0.8                                                                               | 3.0                                                                               |                                                                                     | 0.6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 14.7                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 2: Honoapiilani Highway & Hoohui Road

10/05/2017

|                                |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
|--------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                       | EBL                                                                                | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR  | NBL                                                                               | NBT                                                                               | NBR                                                                                | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations            |                                                                                    |  |  |  |  |      |  |  |  |  |  |  |
| Traffic Volume (veh/h)         | 60                                                                                 | 5                                                                                 | 190                                                                               | 95                                                                                | 20                                                                                | 15   | 160                                                                               | 630                                                                               | 20                                                                                 | 10                                                                                  | 620                                                                                 | 65                                                                                  |
| Future Volume (veh/h)          | 60                                                                                 | 5                                                                                 | 190                                                                               | 95                                                                                | 20                                                                                | 15   | 160                                                                               | 630                                                                               | 20                                                                                 | 10                                                                                  | 620                                                                                 | 65                                                                                  |
| Number                         | 7                                                                                  | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18   | 5                                                                                 | 2                                                                                 | 12                                                                                 | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh            | 0                                                                                  | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)            | 0.98                                                                               |                                                                                   | 0.97                                                                              | 0.98                                                                              |                                                                                   | 0.97 | 1.00                                                                              |                                                                                   | 1.00                                                                               | 1.00                                                                                |                                                                                     | 0.99                                                                                |
| Parking Bus, Adj               | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln         | 1900                                                                               | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h           | 65                                                                                 | 5                                                                                 | 19                                                                                | 103                                                                               | 22                                                                                | 2    | 174                                                                               | 685                                                                               | 0                                                                                  | 11                                                                                  | 674                                                                                 | 31                                                                                  |
| Adj No. of Lanes               | 0                                                                                  | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0    | 1                                                                                 | 1                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor               | 0.92                                                                               | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %           | 2                                                                                  | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                     | 358                                                                                | 23                                                                                | 305                                                                               | 322                                                                               | 331                                                                               | 30   | 370                                                                               | 968                                                                               | 823                                                                                | 319                                                                                 | 820                                                                                 | 692                                                                                 |
| Arrive On Green                | 0.20                                                                               | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20 | 0.09                                                                              | 0.52                                                                              | 0.00                                                                               | 0.01                                                                                | 0.44                                                                                | 0.44                                                                                |
| Sat Flow, veh/h                | 1208                                                                               | 118                                                                               | 1543                                                                              | 1352                                                                              | 1679                                                                              | 153  | 1774                                                                              | 1863                                                                              | 1583                                                                               | 1774                                                                                | 1863                                                                                | 1573                                                                                |
| Grp Volume(v), veh/h           | 70                                                                                 | 0                                                                                 | 19                                                                                | 103                                                                               | 0                                                                                 | 24   | 174                                                                               | 685                                                                               | 0                                                                                  | 11                                                                                  | 674                                                                                 | 31                                                                                  |
| Grp Sat Flow(s),veh/h/ln       | 1326                                                                               | 0                                                                                 | 1543                                                                              | 1352                                                                              | 0                                                                                 | 1831 | 1774                                                                              | 1863                                                                              | 1583                                                                               | 1774                                                                                | 1863                                                                                | 1573                                                                                |
| Q Serve(g_s), s                | 2.3                                                                                | 0.0                                                                               | 0.6                                                                               | 4.1                                                                               | 0.0                                                                               | 0.6  | 2.8                                                                               | 16.3                                                                              | 0.0                                                                                | 0.2                                                                                 | 18.5                                                                                | 0.7                                                                                 |
| Cycle Q Clear(g_c), s          | 2.9                                                                                | 0.0                                                                               | 0.6                                                                               | 7.0                                                                               | 0.0                                                                               | 0.6  | 2.8                                                                               | 16.3                                                                              | 0.0                                                                                | 0.2                                                                                 | 18.5                                                                                | 0.7                                                                                 |
| Prop In Lane                   | 0.93                                                                               |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.08 | 1.00                                                                              |                                                                                   | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h         | 381                                                                                | 0                                                                                 | 305                                                                               | 322                                                                               | 0                                                                                 | 362  | 370                                                                               | 968                                                                               | 823                                                                                | 319                                                                                 | 820                                                                                 | 692                                                                                 |
| V/C Ratio(X)                   | 0.18                                                                               | 0.00                                                                              | 0.06                                                                              | 0.32                                                                              | 0.00                                                                              | 0.07 | 0.47                                                                              | 0.71                                                                              | 0.00                                                                               | 0.03                                                                                | 0.82                                                                                | 0.04                                                                                |
| Avail Cap(c_a), veh/h          | 700                                                                                | 0                                                                                 | 662                                                                               | 635                                                                               | 0                                                                                 | 786  | 671                                                                               | 1630                                                                              | 1386                                                                               | 761                                                                                 | 1630                                                                                | 1376                                                                                |
| HCM Platoon Ratio              | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)             | 1.00                                                                               | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 0.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh       | 20.1                                                                               | 0.0                                                                               | 19.0                                                                              | 23.0                                                                              | 0.0                                                                               | 19.0 | 10.9                                                                              | 10.6                                                                              | 0.0                                                                                | 10.1                                                                                | 14.3                                                                                | 9.3                                                                                 |
| Incr Delay (d2), s/veh         | 0.2                                                                                | 0.0                                                                               | 0.1                                                                               | 0.6                                                                               | 0.0                                                                               | 0.1  | 0.9                                                                               | 1.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 2.1                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh      | 0.0                                                                                | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln       | 1.0                                                                                | 0.0                                                                               | 0.3                                                                               | 1.6                                                                               | 0.0                                                                               | 0.3  | 1.4                                                                               | 8.4                                                                               | 0.0                                                                                | 0.1                                                                                 | 9.8                                                                                 | 0.3                                                                                 |
| LnGrp Delay(d),s/veh           | 20.3                                                                               | 0.0                                                                               | 19.1                                                                              | 23.5                                                                              | 0.0                                                                               | 19.1 | 11.8                                                                              | 11.6                                                                              | 0.0                                                                                | 10.1                                                                                | 16.5                                                                                | 9.3                                                                                 |
| LnGrp LOS                      | C                                                                                  |                                                                                   | B                                                                                 | C                                                                                 |                                                                                   | B    | B                                                                                 | B                                                                                 |                                                                                    | B                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h            | 89                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 127  |                                                                                   | 859                                                                               |                                                                                    | 716                                                                                 |                                                                                     |                                                                                     |
| Approach Delay, s/veh          | 20.1                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 22.7 |                                                                                   | 11.7                                                                              |                                                                                    | 16.1                                                                                |                                                                                     |                                                                                     |
| Approach LOS                   | C                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   | C    |                                                                                   | B                                                                                 |                                                                                    | B                                                                                   |                                                                                     |                                                                                     |
| Timer                          | 1                                                                                  | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6    | 7                                                                                 | 8                                                                                 |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                   | 1                                                                                  | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6    |                                                                                   | 8                                                                                 |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s       | 5.5                                                                                | 36.3                                                                              |                                                                                   | 16.5                                                                              | 10.1                                                                              | 31.6 |                                                                                   | 16.5                                                                              |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s        | 5.0                                                                                | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0  |                                                                                   | 5.0                                                                               |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s    | 15.0                                                                               | 51.0                                                                              |                                                                                   | 25.0                                                                              | 15.0                                                                              | 51.0 |                                                                                   | 25.0                                                                              |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+12.2), s | 12.2                                                                               | 18.3                                                                              |                                                                                   | 4.9                                                                               | 4.8                                                                               | 20.5 |                                                                                   | 9.0                                                                               |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s        | 0.0                                                                                | 5.2                                                                               |                                                                                   | 0.4                                                                               | 0.3                                                                               | 5.1  |                                                                                   | 0.3                                                                               |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary           |                                                                                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay            | 14.6                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                   | B                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Notes                          |                                                                                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 3: Honoapiilani Highway & Akahele Street

10/05/2017

|                               |  |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                      | EBL                                                                                | EBT                                                                               | EBR  | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |   |  |      |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)        | 45                                                                                 | 20                                                                                | 125  | 155                                                                               | 45                                                                                | 150                                                                               | 60                                                                                | 610                                                                                | 130                                                                                 | 135                                                                                 | 715                                                                                 | 30                                                                                  |
| Future Volume (veh/h)         | 45                                                                                 | 20                                                                                | 125  | 155                                                                               | 45                                                                                | 150                                                                               | 60                                                                                | 610                                                                                | 130                                                                                 | 135                                                                                 | 715                                                                                 | 30                                                                                  |
| Number                        | 7                                                                                  | 4                                                                                 | 14   | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                 | 2                                                                                  | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                  | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                               |                                                                                   | 0.98 | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                    | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                               | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1863                                                                               | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 49                                                                                 | 22                                                                                | 6    | 168                                                                               | 49                                                                                | 20                                                                                | 65                                                                                | 663                                                                                | 89                                                                                  | 147                                                                                 | 777                                                                                 | 16                                                                                  |
| Adj No. of Lanes              | 1                                                                                  | 1                                                                                 | 0    | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                               | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                  | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 63                                                                                 | 175                                                                               | 48   | 208                                                                               | 384                                                                               | 324                                                                               | 85                                                                                | 777                                                                                | 661                                                                                 | 186                                                                                 | 883                                                                                 | 751                                                                                 |
| Arrive On Green               | 0.04                                                                               | 0.12                                                                              | 0.12 | 0.12                                                                              | 0.21                                                                              | 0.21                                                                              | 0.05                                                                              | 0.42                                                                               | 0.42                                                                                | 0.10                                                                                | 0.47                                                                                | 0.47                                                                                |
| Sat Flow, veh/h               | 1774                                                                               | 1405                                                                              | 383  | 1774                                                                              | 1863                                                                              | 1574                                                                              | 1774                                                                              | 1863                                                                               | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h          | 49                                                                                 | 0                                                                                 | 28   | 168                                                                               | 49                                                                                | 20                                                                                | 65                                                                                | 663                                                                                | 89                                                                                  | 147                                                                                 | 777                                                                                 | 16                                                                                  |
| Grp Sat Flow(s),veh/h/ln      | 1774                                                                               | 0                                                                                 | 1788 | 1774                                                                              | 1863                                                                              | 1574                                                                              | 1774                                                                              | 1863                                                                               | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Q Serve(g_s), s               | 2.3                                                                                | 0.0                                                                               | 1.2  | 7.8                                                                               | 1.8                                                                               | 0.9                                                                               | 3.1                                                                               | 27.3                                                                               | 2.9                                                                                 | 6.8                                                                                 | 31.9                                                                                | 0.5                                                                                 |
| Cycle Q Clear(g_c), s         | 2.3                                                                                | 0.0                                                                               | 1.2  | 7.8                                                                               | 1.8                                                                               | 0.9                                                                               | 3.1                                                                               | 27.3                                                                               | 2.9                                                                                 | 6.8                                                                                 | 31.9                                                                                | 0.5                                                                                 |
| Prop In Lane                  | 1.00                                                                               |                                                                                   | 0.21 | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                    | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 63                                                                                 | 0                                                                                 | 222  | 208                                                                               | 384                                                                               | 324                                                                               | 85                                                                                | 777                                                                                | 661                                                                                 | 186                                                                                 | 883                                                                                 | 751                                                                                 |
| V/C Ratio(X)                  | 0.78                                                                               | 0.00                                                                              | 0.13 | 0.81                                                                              | 0.13                                                                              | 0.06                                                                              | 0.76                                                                              | 0.85                                                                               | 0.13                                                                                | 0.79                                                                                | 0.88                                                                                | 0.02                                                                                |
| Avail Cap(c_a), veh/h         | 419                                                                                | 0                                                                                 | 443  | 419                                                                               | 462                                                                               | 390                                                                               | 524                                                                               | 1430                                                                               | 1215                                                                                | 524                                                                                 | 1430                                                                                | 1215                                                                                |
| HCM Platoon Ratio             | 1.00                                                                               | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                               | 0.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 40.5                                                                               | 0.0                                                                               | 33.0 | 36.4                                                                              | 27.4                                                                              | 27.0                                                                              | 39.8                                                                              | 22.3                                                                               | 15.2                                                                                | 37.0                                                                                | 20.1                                                                                | 11.8                                                                                |
| Incr Delay (d2), s/veh        | 18.4                                                                               | 0.0                                                                               | 0.3  | 7.2                                                                               | 0.1                                                                               | 0.1                                                                               | 13.2                                                                              | 2.8                                                                                | 0.1                                                                                 | 7.3                                                                                 | 3.9                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                                | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 1.5                                                                                | 0.0                                                                               | 0.6  | 4.2                                                                               | 1.0                                                                               | 0.4                                                                               | 1.8                                                                               | 14.6                                                                               | 1.3                                                                                 | 3.7                                                                                 | 17.2                                                                                | 0.2                                                                                 |
| LnGrp Delay(d),s/veh          | 58.9                                                                               | 0.0                                                                               | 33.2 | 43.7                                                                              | 27.6                                                                              | 27.1                                                                              | 53.0                                                                              | 25.1                                                                               | 15.3                                                                                | 44.3                                                                                | 24.0                                                                                | 11.8                                                                                |
| LnGrp LOS                     | E                                                                                  |                                                                                   | C    | D                                                                                 | C                                                                                 | C                                                                                 | D                                                                                 | C                                                                                  | B                                                                                   | D                                                                                   | C                                                                                   | B                                                                                   |
| Approach Vol, veh/h           | 77                                                                                 |                                                                                   |      |                                                                                   | 237                                                                               |                                                                                   |                                                                                   |                                                                                    | 817                                                                                 |                                                                                     | 940                                                                                 |                                                                                     |
| Approach Delay, s/veh         | 49.6                                                                               |                                                                                   |      |                                                                                   | 39.0                                                                              |                                                                                   |                                                                                   |                                                                                    | 26.3                                                                                |                                                                                     | 27.0                                                                                |                                                                                     |
| Approach LOS                  | D                                                                                  |                                                                                   |      |                                                                                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                    | C                                                                                   |                                                                                     | C                                                                                   |                                                                                     |
| Timer                         | 1                                                                                  | 2                                                                                 | 3    | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                  | 2                                                                                 | 3    | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 13.9                                                                               | 40.3                                                                              | 14.9 | 15.5                                                                              | 9.1                                                                               | 45.2                                                                              | 8.0                                                                               | 22.5                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 5.0                                                                                | 5.0                                                                               | 5.0  | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 25.0                                                                               | 65.0                                                                              | 20.0 | 21.0                                                                              | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.0), s | 19.8                                                                               | 29.3                                                                              | 9.8  | 3.2                                                                               | 5.1                                                                               | 33.9                                                                              | 4.3                                                                               | 3.8                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.3                                                                                | 5.3                                                                               | 0.3  | 0.1                                                                               | 0.1                                                                               | 6.3                                                                               | 0.1                                                                               | 0.2                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                    |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           |                                                                                    |                                                                                   | 28.9 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  |                                                                                    |                                                                                   | C    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 4: Honoapiilani Highway & Lower Honoapiilani Road

10/05/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)        | 40                                                                                | 10                                                                                | 480                                                                               | 20                                                                                | 5                                                                                 | 0                                                                                 | 315                                                                               | 765                                                                               | 45                                                                                | 15                                                                                  | 1005                                                                                | 15                                                                                  |
| Future Volume (veh/h)         | 40                                                                                | 10                                                                                | 480                                                                               | 20                                                                                | 5                                                                                 | 0                                                                                 | 315                                                                               | 765                                                                               | 45                                                                                | 15                                                                                  | 1005                                                                                | 15                                                                                  |
| Number                        | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 0.99                                                                              |                                                                                   | 1.00                                                                              | 0.99                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 43                                                                                | 11                                                                                | 0                                                                                 | 22                                                                                | 5                                                                                 | 0                                                                                 | 342                                                                               | 832                                                                               | 48                                                                                | 16                                                                                  | 1092                                                                                | 7                                                                                   |
| Adj No. of Lanes              | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 177                                                                               | 25                                                                                | 111                                                                               | 179                                                                               | 29                                                                                | 0                                                                                 | 401                                                                               | 2364                                                                              | 136                                                                               | 20                                                                                  | 1701                                                                                | 761                                                                                 |
| Arrive On Green               | 0.08                                                                              | 0.07                                                                              | 0.00                                                                              | 0.08                                                                              | 0.07                                                                              | 0.00                                                                              | 0.23                                                                              | 0.70                                                                              | 0.70                                                                              | 0.01                                                                                | 0.48                                                                                | 0.48                                                                                |
| Sat Flow, veh/h               | 1160                                                                              | 364                                                                               | 1583                                                                              | 1172                                                                              | 414                                                                               | 0                                                                                 | 1774                                                                              | 3402                                                                              | 196                                                                               | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h          | 54                                                                                | 0                                                                                 | 0                                                                                 | 27                                                                                | 0                                                                                 | 0                                                                                 | 342                                                                               | 433                                                                               | 447                                                                               | 16                                                                                  | 1092                                                                                | 7                                                                                   |
| Grp Sat Flow(s),veh/h/ln      | 1525                                                                              | 0                                                                                 | 1583                                                                              | 1586                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                              | 1770                                                                              | 1828                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s               | 1.2                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 12.4                                                                              | 6.6                                                                               | 6.6                                                                               | 0.6                                                                                 | 15.5                                                                                | 0.2                                                                                 |
| Cycle Q Clear(g_c), s         | 2.1                                                                               | 0.0                                                                               | 0.0                                                                               | 0.9                                                                               | 0.0                                                                               | 0.0                                                                               | 12.4                                                                              | 6.6                                                                               | 6.6                                                                               | 0.6                                                                                 | 15.5                                                                                | 0.2                                                                                 |
| Prop In Lane                  | 0.80                                                                              |                                                                                   | 1.00                                                                              | 0.81                                                                              |                                                                                   | 0.00                                                                              | 1.00                                                                              |                                                                                   | 0.11                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 226                                                                               | 0                                                                                 | 111                                                                               | 232                                                                               | 0                                                                                 | 0                                                                                 | 401                                                                               | 1230                                                                              | 1271                                                                              | 20                                                                                  | 1701                                                                                | 761                                                                                 |
| V/C Ratio(X)                  | 0.24                                                                              | 0.00                                                                              | 0.00                                                                              | 0.12                                                                              | 0.00                                                                              | 0.00                                                                              | 0.85                                                                              | 0.35                                                                              | 0.35                                                                              | 0.78                                                                                | 0.64                                                                                | 0.01                                                                                |
| Avail Cap(c_a), veh/h         | 781                                                                               | 0                                                                                 | 708                                                                               | 717                                                                               | 0                                                                                 | 0                                                                                 | 1878                                                                              | 1504                                                                              | 1554                                                                              | 1878                                                                                | 3008                                                                                | 1346                                                                                |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 29.6                                                                              | 0.0                                                                               | 0.0                                                                               | 29.1                                                                              | 0.0                                                                               | 0.0                                                                               | 24.9                                                                              | 4.1                                                                               | 4.1                                                                               | 33.1                                                                                | 13.1                                                                                | 9.1                                                                                 |
| Incr Delay (d2), s/veh        | 0.5                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 2.0                                                                               | 0.4                                                                               | 0.4                                                                               | 20.9                                                                                | 0.9                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 1.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.5                                                                               | 0.0                                                                               | 0.0                                                                               | 6.3                                                                               | 3.3                                                                               | 3.4                                                                               | 0.4                                                                                 | 7.8                                                                                 | 0.1                                                                                 |
| LnGrp Delay(d),s/veh          | 30.1                                                                              | 0.0                                                                               | 0.0                                                                               | 29.3                                                                              | 0.0                                                                               | 0.0                                                                               | 26.9                                                                              | 4.5                                                                               | 4.5                                                                               | 54.0                                                                                | 13.9                                                                                | 9.1                                                                                 |
| LnGrp LOS                     | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 | A                                                                                 | A                                                                                 | D                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h           | 54                                                                                |                                                                                   |                                                                                   |                                                                                   | 27                                                                                |                                                                                   | 1222                                                                              |                                                                                   |                                                                                   |                                                                                     | 1115                                                                                |                                                                                     |
| Approach Delay, s/veh         | 30.1                                                                              |                                                                                   |                                                                                   |                                                                                   | 29.3                                                                              |                                                                                   | 10.8                                                                              |                                                                                   |                                                                                   |                                                                                     | 14.5                                                                                |                                                                                     |
| Approach LOS                  | C                                                                                 |                                                                                   |                                                                                   |                                                                                   | C                                                                                 |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 |                                                                                   |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 19.1                                                                              | 38.2                                                                              |                                                                                   |                                                                                   | 9.7                                                                               | 4.8                                                                               | 52.6                                                                              | 9.7                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                               | 6.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 1.0                                                                               | 57.0                                                                              |                                                                                   |                                                                                   | 27.0                                                                              | 71.0                                                                              | 57.0                                                                              | 30.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.4), s | 14.4                                                                              | 17.5                                                                              |                                                                                   |                                                                                   | 2.9                                                                               | 2.6                                                                               | 8.6                                                                               | 4.1                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.8                                                                               | 14.7                                                                              |                                                                                   |                                                                                   | 0.1                                                                               | 0.0                                                                               | 10.3                                                                              | 0.1                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           |                                                                                   |                                                                                   | 13.1                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 5: Honoapiilani Highway & Kai Malina Parkway/Halawai Drive

10/05/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |  |   |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                   |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)        | 35                                                                                | 0                                                                                 | 70                                                                                | 10                                                                                | 5                                                                                 | 10                                                                                | 135                                                                               | 1170                                                                              | 20                                                                                | 20                                                                                  | 1475                                                                                | 75                                                                                  |
| Future Volume (veh/h)         | 35                                                                                | 0                                                                                 | 70                                                                                | 10                                                                                | 5                                                                                 | 10                                                                                | 135                                                                               | 1170                                                                              | 20                                                                                | 20                                                                                  | 1475                                                                                | 75                                                                                  |
| Number                        | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 38                                                                                | 0                                                                                 | 1                                                                                 | 11                                                                                | 5                                                                                 | 1                                                                                 | 147                                                                               | 1272                                                                              | 21                                                                                | 22                                                                                  | 1603                                                                                | 53                                                                                  |
| Adj No. of Lanes              | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 161                                                                               | 0                                                                                 | 71                                                                                | 103                                                                               | 21                                                                                | 3                                                                                 | 183                                                                               | 2721                                                                              | 45                                                                                | 26                                                                                  | 2389                                                                                | 1069                                                                                |
| Arrive On Green               | 0.06                                                                              | 0.00                                                                              | 0.04                                                                              | 0.06                                                                              | 0.04                                                                              | 0.04                                                                              | 0.10                                                                              | 0.76                                                                              | 0.76                                                                              | 0.01                                                                                | 0.67                                                                                | 0.67                                                                                |
| Sat Flow, veh/h               | 1558                                                                              | 0                                                                                 | 1583                                                                              | 634                                                                               | 475                                                                               | 69                                                                                | 1774                                                                              | 3563                                                                              | 59                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h          | 38                                                                                | 0                                                                                 | 1                                                                                 | 17                                                                                | 0                                                                                 | 0                                                                                 | 147                                                                               | 632                                                                               | 661                                                                               | 22                                                                                  | 1603                                                                                | 53                                                                                  |
| Grp Sat Flow(s),veh/h/ln      | 1558                                                                              | 0                                                                                 | 1583                                                                              | 1178                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                              | 1770                                                                              | 1852                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.3                                                                               | 0.0                                                                               | 0.0                                                                               | 6.4                                                                               | 10.4                                                                              | 10.4                                                                              | 1.0                                                                                 | 21.3                                                                                | 0.9                                                                                 |
| Cycle Q Clear(g_c), s         | 1.6                                                                               | 0.0                                                                               | 0.0                                                                               | 1.9                                                                               | 0.0                                                                               | 0.0                                                                               | 6.4                                                                               | 10.4                                                                              | 10.4                                                                              | 1.0                                                                                 | 21.3                                                                                | 0.9                                                                                 |
| Prop In Lane                  | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.65                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                              |                                                                                   | 0.03                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 181                                                                               | 0                                                                                 | 71                                                                                | 143                                                                               | 0                                                                                 | 0                                                                                 | 183                                                                               | 1351                                                                              | 1414                                                                              | 26                                                                                  | 2389                                                                                | 1069                                                                                |
| V/C Ratio(X)                  | 0.21                                                                              | 0.00                                                                              | 0.01                                                                              | 0.12                                                                              | 0.00                                                                              | 0.00                                                                              | 0.80                                                                              | 0.47                                                                              | 0.47                                                                              | 0.85                                                                                | 0.67                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h         | 526                                                                               | 0                                                                                 | 461                                                                               | 519                                                                               | 0                                                                                 | 0                                                                                 | 471                                                                               | 1926                                                                              | 2016                                                                              | 247                                                                                 | 3403                                                                                | 1523                                                                                |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 36.3                                                                              | 0.0                                                                               | 36.1                                                                              | 36.4                                                                              | 0.0                                                                               | 0.0                                                                               | 34.7                                                                              | 3.4                                                                               | 3.4                                                                               | 38.9                                                                                | 7.6                                                                                 | 4.3                                                                                 |
| Incr Delay (d2), s/veh        | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 0.1                                                                               | 0.0                                                                               | 0.0                                                                               | 3.1                                                                               | 0.5                                                                               | 0.5                                                                               | 23.8                                                                                | 0.7                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 0.4                                                                               | 0.0                                                                               | 0.0                                                                               | 3.3                                                                               | 5.1                                                                               | 5.3                                                                               | 0.6                                                                                 | 10.5                                                                                | 0.4                                                                                 |
| LnGrp Delay(d),s/veh          | 36.6                                                                              | 0.0                                                                               | 36.1                                                                              | 36.6                                                                              | 0.0                                                                               | 0.0                                                                               | 37.7                                                                              | 4.0                                                                               | 4.0                                                                               | 62.7                                                                                | 8.3                                                                                 | 4.4                                                                                 |
| LnGrp LOS                     | D                                                                                 |                                                                                   | D                                                                                 | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 | A                                                                                 | A                                                                                 | E                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h           | 39                                                                                |                                                                                   |                                                                                   |                                                                                   | 17                                                                                |                                                                                   | 1440                                                                              |                                                                                   |                                                                                   |                                                                                     | 1678                                                                                |                                                                                     |
| Approach Delay, s/veh         | 36.5                                                                              |                                                                                   |                                                                                   |                                                                                   | 36.6                                                                              |                                                                                   | 7.4                                                                               |                                                                                   |                                                                                   |                                                                                     | 8.9                                                                                 |                                                                                     |
| Approach LOS                  | D                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 |                                                                                   |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 12.2                                                                              | 58.3                                                                              |                                                                                   |                                                                                   | 8.5                                                                               | 5.1                                                                               | 65.3                                                                              | 8.5                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 21.0                                                                              | 76.0                                                                              |                                                                                   |                                                                                   | 23.0                                                                              | 11.0                                                                              | 86.0                                                                              | 23.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.0), s | 19.4                                                                              | 23.3                                                                              |                                                                                   |                                                                                   | 3.9                                                                               | 3.0                                                                               | 12.4                                                                              | 3.6                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.1                                                                               | 30.1                                                                              |                                                                                   |                                                                                   | 0.0                                                                               | 0.0                                                                               | 21.1                                                                              | 0.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           |                                                                                   |                                                                                   | 8.7                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 6: Honoapiilani Highway & Kai Ala Drive/Puukolii Road

10/05/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |  |   |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)        | 60                                                                                | 5                                                                                 | 35                                                                                | 40                                                                                | 15                                                                                | 55                                                                                | 110                                                                               | 1325                                                                              | 60                                                                                | 30                                                                                  | 1415                                                                                | 50                                                                                  |
| Future Volume (veh/h)         | 60                                                                                | 5                                                                                 | 35                                                                                | 40                                                                                | 15                                                                                | 55                                                                                | 110                                                                               | 1325                                                                              | 60                                                                                | 30                                                                                  | 1415                                                                                | 50                                                                                  |
| Number                        | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 65                                                                                | 5                                                                                 | 1                                                                                 | 43                                                                                | 16                                                                                | 1                                                                                 | 120                                                                               | 1440                                                                              | 48                                                                                | 33                                                                                  | 1538                                                                                | 39                                                                                  |
| Adj No. of Lanes              | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 1                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 165                                                                               | 11                                                                                | 158                                                                               | 111                                                                               | 174                                                                               | 11                                                                                | 142                                                                               | 2756                                                                              | 1233                                                                              | 43                                                                                  | 2560                                                                                | 1145                                                                                |
| Arrive On Green               | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.08                                                                              | 0.78                                                                              | 0.78                                                                              | 0.02                                                                                | 0.72                                                                                | 0.72                                                                                |
| Sat Flow, veh/h               | 1202                                                                              | 111                                                                               | 1579                                                                              | 1401                                                                              | 1735                                                                              | 108                                                                               | 1774                                                                              | 3539                                                                              | 1583                                                                              | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h          | 70                                                                                | 0                                                                                 | 1                                                                                 | 43                                                                                | 0                                                                                 | 17                                                                                | 120                                                                               | 1440                                                                              | 48                                                                                | 33                                                                                  | 1538                                                                                | 39                                                                                  |
| Grp Sat Flow(s),veh/h/ln      | 1313                                                                              | 0                                                                                 | 1579                                                                              | 1401                                                                              | 0                                                                                 | 1843                                                                              | 1774                                                                              | 1770                                                                              | 1583                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s               | 7.1                                                                               | 0.0                                                                               | 0.1                                                                               | 4.7                                                                               | 0.0                                                                               | 1.3                                                                               | 10.3                                                                              | 23.5                                                                              | 1.1                                                                               | 2.9                                                                                 | 33.0                                                                                | 1.1                                                                                 |
| Cycle Q Clear(g_c), s         | 8.4                                                                               | 0.0                                                                               | 0.1                                                                               | 13.1                                                                              | 0.0                                                                               | 1.3                                                                               | 10.3                                                                              | 23.5                                                                              | 1.1                                                                               | 2.9                                                                                 | 33.0                                                                                | 1.1                                                                                 |
| Prop In Lane                  | 0.93                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 176                                                                               | 0                                                                                 | 158                                                                               | 111                                                                               | 0                                                                                 | 184                                                                               | 142                                                                               | 2756                                                                              | 1233                                                                              | 43                                                                                  | 2560                                                                                | 1145                                                                                |
| V/C Ratio(X)                  | 0.40                                                                              | 0.00                                                                              | 0.01                                                                              | 0.39                                                                              | 0.00                                                                              | 0.09                                                                              | 0.85                                                                              | 0.52                                                                              | 0.04                                                                              | 0.76                                                                                | 0.60                                                                                | 0.03                                                                                |
| Avail Cap(c_a), veh/h         | 254                                                                               | 0                                                                                 | 244                                                                               | 187                                                                               | 0                                                                                 | 285                                                                               | 240                                                                               | 2756                                                                              | 1233                                                                              | 240                                                                                 | 2560                                                                                | 1145                                                                                |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.72                                                                              | 0.72                                                                              | 0.72                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 67.0                                                                              | 0.0                                                                               | 62.8                                                                              | 72.8                                                                              | 0.0                                                                               | 63.4                                                                              | 70.4                                                                              | 6.4                                                                               | 3.9                                                                               | 75.2                                                                                | 10.5                                                                                | 6.1                                                                                 |
| Incr Delay (d2), s/veh        | 1.4                                                                               | 0.0                                                                               | 0.0                                                                               | 2.2                                                                               | 0.0                                                                               | 0.2                                                                               | 3.8                                                                               | 0.5                                                                               | 0.0                                                                               | 9.7                                                                                 | 1.1                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 2.9                                                                               | 0.0                                                                               | 0.0                                                                               | 1.9                                                                               | 0.0                                                                               | 0.7                                                                               | 5.2                                                                               | 11.6                                                                              | 0.5                                                                               | 1.5                                                                                 | 16.4                                                                                | 0.5                                                                                 |
| LnGrp Delay(d),s/veh          | 68.5                                                                              | 0.0                                                                               | 62.8                                                                              | 75.0                                                                              | 0.0                                                                               | 63.6                                                                              | 74.2                                                                              | 6.9                                                                               | 4.0                                                                               | 84.8                                                                                | 11.6                                                                                | 6.1                                                                                 |
| LnGrp LOS                     | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                 | A                                                                                 | A                                                                                 | F                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h           |                                                                                   | 71                                                                                |                                                                                   |                                                                                   | 60                                                                                |                                                                                   |                                                                                   | 1608                                                                              |                                                                                   |                                                                                     | 1610                                                                                |                                                                                     |
| Approach Delay, s/veh         |                                                                                   | 68.4                                                                              |                                                                                   |                                                                                   | 71.8                                                                              |                                                                                   |                                                                                   | 11.8                                                                              |                                                                                   |                                                                                     | 12.9                                                                                |                                                                                     |
| Approach LOS                  |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 16.4                                                                              | 118.1                                                                             |                                                                                   | 20.5                                                                              | 7.8                                                                               | 126.7                                                                             |                                                                                   | 20.5                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 21.0                                                                              | 95.0                                                                              |                                                                                   | 24.0                                                                              | 21.0                                                                              | 95.0                                                                              |                                                                                   | 24.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1/3), s | 12.3                                                                              | 35.0                                                                              |                                                                                   | 15.1                                                                              | 4.9                                                                               | 25.5                                                                              |                                                                                   | 10.4                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.1                                                                               | 29.9                                                                              |                                                                                   | 0.1                                                                               | 0.0                                                                               | 28.5                                                                              |                                                                                   | 0.1                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           |                                                                                   |                                                                                   | 14.6                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 7: Honoapiilani Highway & Kaanapali Parkway/Halelo Street

10/05/2017

|                               |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)        | 155                                                                               | 10                                                                                | 235                                                                               | 10                                                                                | 10                                                                                | 10                                                                                | 460                                                                               | 1385                                                                              | 15                                                                                | 85                                                                                  | 1330                                                                                | 125                                                                                 |
| Future Volume (veh/h)         | 155                                                                               | 10                                                                                | 235                                                                               | 10                                                                                | 10                                                                                | 10                                                                                | 460                                                                               | 1385                                                                              | 15                                                                                | 85                                                                                  | 1330                                                                                | 125                                                                                 |
| Number                        | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 176                                                                               | 0                                                                                 | 70                                                                                | 11                                                                                | 11                                                                                | 3                                                                                 | 500                                                                               | 1505                                                                              | 16                                                                                | 92                                                                                  | 1446                                                                                | 101                                                                                 |
| Adj No. of Lanes              | 2                                                                                 | 0                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 2                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 329                                                                               | 0                                                                                 | 838                                                                               | 57                                                                                | 57                                                                                | 16                                                                                | 627                                                                               | 2239                                                                              | 24                                                                                | 146                                                                                 | 1857                                                                                | 962                                                                                 |
| Arrive On Green               | 0.09                                                                              | 0.00                                                                              | 0.08                                                                              | 0.07                                                                              | 0.07                                                                              | 0.05                                                                              | 0.18                                                                              | 0.62                                                                              | 0.61                                                                              | 0.08                                                                                | 0.52                                                                                | 0.52                                                                                |
| Sat Flow, veh/h               | 3548                                                                              | 0                                                                                 | 3073                                                                              | 783                                                                               | 783                                                                               | 213                                                                               | 3442                                                                              | 3588                                                                              | 38                                                                                | 1774                                                                                | 3539                                                                                | 1578                                                                                |
| Grp Volume(v), veh/h          | 176                                                                               | 0                                                                                 | 70                                                                                | 25                                                                                | 0                                                                                 | 0                                                                                 | 500                                                                               | 742                                                                               | 779                                                                               | 92                                                                                  | 1446                                                                                | 101                                                                                 |
| Grp Sat Flow(s),veh/h/ln      | 1774                                                                              | 0                                                                                 | 1537                                                                              | 1779                                                                              | 0                                                                                 | 0                                                                                 | 1721                                                                              | 1770                                                                              | 1856                                                                              | 1774                                                                                | 1770                                                                                | 1578                                                                                |
| Q Serve(g_s), s               | 5.9                                                                               | 0.0                                                                               | 2.1                                                                               | 1.7                                                                               | 0.0                                                                               | 0.0                                                                               | 17.4                                                                              | 34.0                                                                              | 34.1                                                                              | 6.3                                                                                 | 41.1                                                                                | 3.3                                                                                 |
| Cycle Q Clear(g_c), s         | 5.9                                                                               | 0.0                                                                               | 2.1                                                                               | 1.7                                                                               | 0.0                                                                               | 0.0                                                                               | 17.4                                                                              | 34.0                                                                              | 34.1                                                                              | 6.3                                                                                 | 41.1                                                                                | 3.3                                                                                 |
| Prop In Lane                  | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.44                                                                              |                                                                                   | 0.12                                                                              | 1.00                                                                              |                                                                                   | 0.02                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 329                                                                               | 0                                                                                 | 838                                                                               | 129                                                                               | 0                                                                                 | 0                                                                                 | 627                                                                               | 1105                                                                              | 1159                                                                              | 146                                                                                 | 1857                                                                                | 962                                                                                 |
| V/C Ratio(X)                  | 0.53                                                                              | 0.00                                                                              | 0.08                                                                              | 0.19                                                                              | 0.00                                                                              | 0.00                                                                              | 0.80                                                                              | 0.67                                                                              | 0.67                                                                              | 0.63                                                                                | 0.78                                                                                | 0.10                                                                                |
| Avail Cap(c_a), veh/h         | 963                                                                               | 0                                                                                 | 1387                                                                              | 440                                                                               | 0                                                                                 | 0                                                                                 | 1594                                                                              | 2741                                                                              | 2875                                                                              | 212                                                                                 | 4267                                                                                | 2037                                                                                |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 54.2                                                                              | 0.0                                                                               | 34.4                                                                              | 54.8                                                                              | 0.0                                                                               | 0.0                                                                               | 49.0                                                                              | 15.2                                                                              | 15.3                                                                              | 55.6                                                                                | 23.9                                                                                | 10.2                                                                                |
| Incr Delay (d2), s/veh        | 0.5                                                                               | 0.0                                                                               | 0.0                                                                               | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 0.9                                                                               | 1.0                                                                               | 1.0                                                                               | 1.7                                                                                 | 1.0                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 2.9                                                                               | 0.0                                                                               | 0.9                                                                               | 0.8                                                                               | 0.0                                                                               | 0.0                                                                               | 8.3                                                                               | 16.8                                                                              | 17.6                                                                              | 3.2                                                                                 | 20.4                                                                                | 1.8                                                                                 |
| LnGrp Delay(d),s/veh          | 54.7                                                                              | 0.0                                                                               | 34.4                                                                              | 55.5                                                                              | 0.0                                                                               | 0.0                                                                               | 49.9                                                                              | 16.2                                                                              | 16.2                                                                              | 57.2                                                                                | 25.0                                                                                | 10.3                                                                                |
| LnGrp LOS                     | D                                                                                 |                                                                                   | C                                                                                 | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 | B                                                                                 | B                                                                                 | E                                                                                   | C                                                                                   | B                                                                                   |
| Approach Vol, veh/h           | 246                                                                               |                                                                                   |                                                                                   | 25                                                                                |                                                                                   |                                                                                   | 2021                                                                              |                                                                                   |                                                                                   | 1639                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 49.0                                                                              |                                                                                   |                                                                                   | 55.5                                                                              |                                                                                   |                                                                                   | 24.6                                                                              |                                                                                   |                                                                                   | 25.9                                                                                |                                                                                     |                                                                                     |
| Approach LOS                  | D                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                   |                                                                                     |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 26.8                                                                              | 69.7                                                                              |                                                                                   | 13.1                                                                              | 14.3                                                                              | 82.2                                                                              |                                                                                   | 15.6                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 6.0                                                                               | 6.0                                                                               |                                                                                   | 7.0                                                                               | 6.0                                                                               | 6.0                                                                               |                                                                                   | 7.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 50.0                                                                              | 149.0                                                                             |                                                                                   | 28.0                                                                              | 13.0                                                                              | 192.0                                                                             |                                                                                   | 31.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.4), s | 19.4                                                                              | 43.1                                                                              |                                                                                   | 3.7                                                                               | 8.3                                                                               | 36.1                                                                              |                                                                                   | 7.9                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 1.4                                                                               | 20.6                                                                              |                                                                                   | 0.0                                                                               | 0.1                                                                               | 18.7                                                                              |                                                                                   | 0.7                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           | 26.8                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 8: Honoapiilani Highway & Leialii Parkway

10/05/2017

|                               |  |       |      |      |      |       |      |      |      |      |      |      |
|-------------------------------|------------------------------------------------------------------------------------|-------|------|------|------|-------|------|------|------|------|------|------|
| Movement                      | EBL                                                                                | EBT   | EBR  | WBL  | WBT  | WBR   | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations           |                                                                                    | ↔     |      | ↖    | ↗    |       | ↖    | ↗    |      | ↖    | ↗    |      |
| Traffic Volume (veh/h)        | 5                                                                                  | 5     | 5    | 60   | 0    | 45    | 5    | 1860 | 90   | 35   | 1520 | 5    |
| Future Volume (veh/h)         | 5                                                                                  | 5     | 5    | 60   | 0    | 45    | 5    | 1860 | 90   | 35   | 1520 | 5    |
| Number                        | 3                                                                                  | 8     | 18   | 7    | 4    | 14    | 1    | 6    | 16   | 5    | 2    | 12   |
| Initial Q (Qb), veh           | 0                                                                                  | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)           | 0.98                                                                               |       | 0.97 | 0.98 |      | 0.97  | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Parking Bus, Adj              | 1.00                                                                               | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln        | 1900                                                                               | 1863  | 1900 | 1863 | 1863 | 1900  | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h          | 5                                                                                  | 5     | 1    | 65   | 0    | 1     | 5    | 2022 | 96   | 38   | 1652 | 5    |
| Adj No. of Lanes              | 0                                                                                  | 1     | 0    | 1    | 1    | 0     | 1    | 2    | 0    | 1    | 2    | 0    |
| Peak Hour Factor              | 0.92                                                                               | 0.92  | 0.92 | 0.92 | 0.92 | 0.92  | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, %          | 2                                                                                  | 2     | 2    | 2    | 2    | 2     | 2    | 2    | 2    | 2    | 2    | 2    |
| Cap, veh/h                    | 90                                                                                 | 80    | 13   | 176  | 0    | 138   | 11   | 2715 | 128  | 63   | 2962 | 9    |
| Arrive On Green               | 0.09                                                                               | 0.09  | 0.08 | 0.09 | 0.00 | 0.08  | 0.01 | 0.79 | 0.78 | 0.04 | 0.82 | 0.81 |
| Sat Flow, veh/h               | 584                                                                                | 895   | 148  | 1372 | 0    | 1543  | 1774 | 3441 | 162  | 1774 | 3619 | 11   |
| Grp Volume(v), veh/h          | 11                                                                                 | 0     | 0    | 65   | 0    | 1     | 5    | 1032 | 1086 | 38   | 807  | 850  |
| Grp Sat Flow(s),veh/h/ln      | 1627                                                                               | 0     | 0    | 1372 | 0    | 1543  | 1774 | 1770 | 1834 | 1774 | 1770 | 1861 |
| Q Serve(g_s), s               | 0.0                                                                                | 0.0   | 0.0  | 5.4  | 0.0  | 0.1   | 0.4  | 41.3 | 43.0 | 3.0  | 21.3 | 21.4 |
| Cycle Q Clear(g_c), s         | 0.8                                                                                | 0.0   | 0.0  | 6.1  | 0.0  | 0.1   | 0.4  | 41.3 | 43.0 | 3.0  | 21.3 | 21.4 |
| Prop In Lane                  | 0.45                                                                               |       | 0.09 | 1.00 |      | 1.00  | 1.00 |      | 0.09 | 1.00 |      | 0.01 |
| Lane Grp Cap(c), veh/h        | 183                                                                                | 0     | 0    | 176  | 0    | 138   | 11   | 1396 | 1447 | 63   | 1448 | 1523 |
| V/C Ratio(X)                  | 0.06                                                                               | 0.00  | 0.00 | 0.37 | 0.00 | 0.01  | 0.45 | 0.74 | 0.75 | 0.60 | 0.56 | 0.56 |
| Avail Cap(c_a), veh/h         | 312                                                                                | 0     | 0    | 289  | 0    | 265   | 101  | 1396 | 1447 | 101  | 1448 | 1523 |
| HCM Platoon Ratio             | 1.00                                                                               | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I)            | 1.00                                                                               | 0.00  | 0.00 | 1.00 | 0.00 | 1.00  | 0.58 | 0.58 | 0.58 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh      | 58.4                                                                               | 0.0   | 0.0  | 60.7 | 0.0  | 58.5  | 69.3 | 7.5  | 7.7  | 66.5 | 4.2  | 4.2  |
| Incr Delay (d2), s/veh        | 0.1                                                                                | 0.0   | 0.0  | 1.3  | 0.0  | 0.0   | 5.9  | 2.1  | 2.1  | 3.4  | 1.6  | 1.5  |
| Initial Q Delay(d3),s/veh     | 0.0                                                                                | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln      | 0.4                                                                                | 0.0   | 0.0  | 2.5  | 0.0  | 0.0   | 0.2  | 20.6 | 22.3 | 1.5  | 10.9 | 11.5 |
| LnGrp Delay(d),s/veh          | 58.6                                                                               | 0.0   | 0.0  | 62.0 | 0.0  | 58.6  | 75.2 | 9.5  | 9.8  | 69.9 | 5.8  | 5.7  |
| LnGrp LOS                     | E                                                                                  |       |      | E    |      | E     | E    | A    | A    | E    | A    | A    |
| Approach Vol, veh/h           | 11                                                                                 |       |      | 66   |      |       | 2123 |      |      | 1695 |      |      |
| Approach Delay, s/veh         | 58.6                                                                               |       |      | 62.0 |      |       | 9.8  |      |      | 7.2  |      |      |
| Approach LOS                  | E                                                                                  |       |      | E    |      |       | A    |      |      | A    |      |      |
| Timer                         | 1                                                                                  | 2     | 3    | 4    | 5    | 6     | 7    | 8    |      |      |      |      |
| Assigned Phs                  | 1                                                                                  | 2     |      | 4    | 5    | 6     |      | 8    |      |      |      |      |
| Phs Duration (G+Y+Rc), s      | 4.9                                                                                | 118.6 |      | 16.5 | 9.0  | 114.5 |      | 16.5 |      |      |      |      |
| Change Period (Y+Rc), s       | 4.0                                                                                | 5.0   |      | 5.0  | 4.0  | 5.0   |      | 5.0  |      |      |      |      |
| Max Green Setting (Gmax), s   | 95.0                                                                               | 95.0  |      | 23.0 | 8.0  | 95.0  |      | 23.0 |      |      |      |      |
| Max Q Clear Time (g_c+1/4), s | 23.4                                                                               | 23.4  |      | 8.1  | 5.0  | 45.0  |      | 2.8  |      |      |      |      |
| Green Ext Time (p_c), s       | 0.0                                                                                | 34.6  |      | 0.1  | 0.0  | 40.8  |      | 0.0  |      |      |      |      |
| Intersection Summary          |                                                                                    |       |      |      |      |       |      |      |      |      |      |      |
| HCM 2010 Ctrl Delay           | 9.7                                                                                |       |      |      |      |       |      |      |      |      |      |      |
| HCM 2010 LOS                  | A                                                                                  |       |      |      |      |       |      |      |      |      |      |      |

# HCM 2010 Signalized Intersection Summary

## 9: Honoapiilani Highway & Front Street/Flemming Road

10/05/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                   |  |                                                                                   |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)        | 95                                                                                | 5                                                                                 | 5                                                                                 | 105                                                                               | 15                                                                                | 15                                                                                | 5                                                                                 | 1830                                                                              | 20                                                                                | 10                                                                                  | 1345                                                                                | 210                                                                                 |
| Future Volume (veh/h)         | 95                                                                                | 5                                                                                 | 5                                                                                 | 105                                                                               | 15                                                                                | 15                                                                                | 5                                                                                 | 1830                                                                              | 20                                                                                | 10                                                                                  | 1345                                                                                | 210                                                                                 |
| Number                        | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 103                                                                               | 5                                                                                 | 3                                                                                 | 114                                                                               | 16                                                                                | 12                                                                                | 5                                                                                 | 1989                                                                              | 22                                                                                | 11                                                                                  | 1462                                                                                | 166                                                                                 |
| Adj No. of Lanes              | 0                                                                                 | 1                                                                                 | 0                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 210                                                                               | 7                                                                                 | 4                                                                                 | 198                                                                               | 20                                                                                | 15                                                                                | 7                                                                                 | 2808                                                                              | 31                                                                                | 14                                                                                  | 2785                                                                                | 1246                                                                                |
| Arrive On Green               | 0.11                                                                              | 0.11                                                                              | 0.10                                                                              | 0.11                                                                              | 0.11                                                                              | 0.10                                                                              | 0.00                                                                              | 0.78                                                                              | 0.77                                                                              | 0.01                                                                                | 0.79                                                                                | 0.79                                                                                |
| Sat Flow, veh/h               | 1391                                                                              | 68                                                                                | 41                                                                                | 1323                                                                              | 186                                                                               | 139                                                                               | 1774                                                                              | 3586                                                                              | 40                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h          | 111                                                                               | 0                                                                                 | 0                                                                                 | 142                                                                               | 0                                                                                 | 0                                                                                 | 5                                                                                 | 980                                                                               | 1031                                                                              | 11                                                                                  | 1462                                                                                | 166                                                                                 |
| Grp Sat Flow(s),veh/h/ln      | 1499                                                                              | 0                                                                                 | 0                                                                                 | 1647                                                                              | 0                                                                                 | 0                                                                                 | 1774                                                                              | 1770                                                                              | 1856                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 1.3                                                                               | 0.0                                                                               | 0.0                                                                               | 0.3                                                                               | 32.3                                                                              | 32.6                                                                              | 0.7                                                                                 | 18.0                                                                                | 3.0                                                                                 |
| Cycle Q Clear(g_c), s         | 8.3                                                                               | 0.0                                                                               | 0.0                                                                               | 9.6                                                                               | 0.0                                                                               | 0.0                                                                               | 0.3                                                                               | 32.3                                                                              | 32.6                                                                              | 0.7                                                                                 | 18.0                                                                                | 3.0                                                                                 |
| Prop In Lane                  | 0.93                                                                              |                                                                                   | 0.03                                                                              | 0.80                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                              |                                                                                   | 0.02                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 221                                                                               | 0                                                                                 | 0                                                                                 | 234                                                                               | 0                                                                                 | 0                                                                                 | 7                                                                                 | 1386                                                                              | 1453                                                                              | 14                                                                                  | 2785                                                                                | 1246                                                                                |
| V/C Ratio(X)                  | 0.50                                                                              | 0.00                                                                              | 0.00                                                                              | 0.61                                                                              | 0.00                                                                              | 0.00                                                                              | 0.73                                                                              | 0.71                                                                              | 0.71                                                                              | 0.81                                                                                | 0.52                                                                                | 0.13                                                                                |
| Avail Cap(c_a), veh/h         | 430                                                                               | 0                                                                                 | 0                                                                                 | 451                                                                               | 0                                                                                 | 0                                                                                 | 118                                                                               | 1386                                                                              | 1453                                                                              | 118                                                                                 | 2785                                                                                | 1246                                                                                |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.63                                                                              | 0.63                                                                              | 0.63                                                                              | 0.82                                                                                | 0.82                                                                                | 0.82                                                                                |
| Uniform Delay (d), s/veh      | 51.3                                                                              | 0.0                                                                               | 0.0                                                                               | 51.9                                                                              | 0.0                                                                               | 0.0                                                                               | 59.7                                                                              | 6.3                                                                               | 6.4                                                                               | 59.5                                                                                | 4.6                                                                                 | 3.0                                                                                 |
| Incr Delay (d2), s/veh        | 1.8                                                                               | 0.0                                                                               | 0.0                                                                               | 2.5                                                                               | 0.0                                                                               | 0.0                                                                               | 29.5                                                                              | 1.9                                                                               | 1.9                                                                               | 27.7                                                                                | 0.6                                                                                 | 0.2                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 8.7                                                                               | 0.0                                                                               | 0.0                                                                               | 4.7                                                                               | 0.0                                                                               | 0.0                                                                               | 0.2                                                                               | 16.3                                                                              | 17.1                                                                              | 0.5                                                                                 | 8.8                                                                                 | 1.4                                                                                 |
| LnGrp Delay(d),s/veh          | 53.1                                                                              | 0.0                                                                               | 0.0                                                                               | 54.4                                                                              | 0.0                                                                               | 0.0                                                                               | 89.2                                                                              | 8.3                                                                               | 8.2                                                                               | 87.1                                                                                | 5.2                                                                                 | 3.2                                                                                 |
| LnGrp LOS                     | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | F                                                                                 | A                                                                                 | A                                                                                 | F                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h           |                                                                                   | 111                                                                               |                                                                                   |                                                                                   | 142                                                                               |                                                                                   |                                                                                   | 2016                                                                              |                                                                                   |                                                                                     | 1639                                                                                |                                                                                     |
| Approach Delay, s/veh         |                                                                                   | 53.1                                                                              |                                                                                   |                                                                                   | 54.4                                                                              |                                                                                   |                                                                                   | 8.4                                                                               |                                                                                   |                                                                                     | 5.6                                                                                 |                                                                                     |
| Approach LOS                  |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                     | A                                                                                   |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 4.5                                                                               | 98.4                                                                              |                                                                                   | 17.1                                                                              | 4.9                                                                               | 98.0                                                                              |                                                                                   | 17.1                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 68.0                                                                              | 68.0                                                                              |                                                                                   | 30.0                                                                              | 8.0                                                                               | 68.0                                                                              |                                                                                   | 30.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1/3), s | 20.0                                                                              | 20.0                                                                              |                                                                                   | 11.6                                                                              | 2.7                                                                               | 34.6                                                                              |                                                                                   | 10.3                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.0                                                                               | 33.7                                                                              |                                                                                   | 0.5                                                                               | 0.0                                                                               | 30.6                                                                              |                                                                                   | 0.3                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           |                                                                                   |                                                                                   | 10.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 10: Honoapiilani Highway & Kapunakea Street

10/05/2017

|                              | <div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div> |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------|
| Movement                     | EBL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | EBT                                                                               | EBR  | WBL                                                                               | WBT                                                                               | WBR  | NBL                                                                               | NBT                                                                               | NBR  | SBL                                                                                 | SBT                                                                                 | SBR  |
| Lane Configurations          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |      |  |  |      |  |  |      |  |  |      |
| Traffic Volume (veh/h)       | 155                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 30                                                                                | 20   | 145                                                                               | 25                                                                                | 35   | 25                                                                                | 1640                                                                              | 75   | 10                                                                                  | 1375                                                                                | 80   |
| Future Volume (veh/h)        | 155                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 30                                                                                | 20   | 145                                                                               | 25                                                                                | 35   | 25                                                                                | 1640                                                                              | 75   | 10                                                                                  | 1375                                                                                | 80   |
| Number                       | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 8                                                                                 | 18   | 7                                                                                 | 4                                                                                 | 14   | 1                                                                                 | 6                                                                                 | 16   | 5                                                                                   | 2                                                                                   | 12   |
| Initial Q (Qb), veh          | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   | 0                                                                                   | 0    |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                   | 0.98 | 0.99                                                                              |                                                                                   | 0.98 | 1.00                                                                              |                                                                                   | 1.00 | 1.00                                                                                |                                                                                     | 1.00 |
| Parking Bus, Adj             | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00 |
| Adj Sat Flow, veh/h/ln       | 1863                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                                | 1863                                                                                | 1900 |
| Adj Flow Rate, veh/h         | 168                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 33                                                                                | 2    | 158                                                                               | 27                                                                                | 3    | 27                                                                                | 1783                                                                              | 80   | 11                                                                                  | 1495                                                                                | 85   |
| Adj No. of Lanes             | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1                                                                                 | 0    | 1                                                                                 | 1                                                                                 | 0    | 1                                                                                 | 2                                                                                 | 0    | 1                                                                                   | 2                                                                                   | 0    |
| Peak Hour Factor             | 0.92                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                                | 0.92                                                                                | 0.92 |
| Percent Heavy Veh, %         | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                   | 2                                                                                   | 2    |
| Cap, veh/h                   | 256                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 287                                                                               | 17   | 252                                                                               | 272                                                                               | 30   | 34                                                                                | 2560                                                                              | 114  | 13                                                                                  | 2486                                                                                | 141  |
| Arrive On Green              | 0.17                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.17                                                                              | 0.17 | 0.17                                                                              | 0.17                                                                              | 0.16 | 0.04                                                                              | 1.00                                                                              | 1.00 | 0.01                                                                                | 0.73                                                                                | 0.72 |
| Sat Flow, veh/h              | 1353                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1737                                                                              | 105  | 1348                                                                              | 1644                                                                              | 183  | 1774                                                                              | 3451                                                                              | 154  | 1774                                                                                | 3405                                                                                | 193  |
| Grp Volume(v), veh/h         | 168                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0                                                                                 | 35   | 158                                                                               | 0                                                                                 | 30   | 27                                                                                | 909                                                                               | 954  | 11                                                                                  | 774                                                                                 | 806  |
| Grp Sat Flow(s),veh/h/ln     | 1353                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0                                                                                 | 1842 | 1348                                                                              | 0                                                                                 | 1827 | 1774                                                                              | 1770                                                                              | 1836 | 1774                                                                                | 1770                                                                                | 1829 |
| Q Serve(g_s), s              | 16.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.0                                                                               | 2.3  | 15.8                                                                              | 0.0                                                                               | 2.0  | 2.1                                                                               | 0.0                                                                               | 0.0  | 0.9                                                                                 | 29.4                                                                                | 29.8 |
| Cycle Q Clear(g_c), s        | 18.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.0                                                                               | 2.3  | 18.1                                                                              | 0.0                                                                               | 2.0  | 2.1                                                                               | 0.0                                                                               | 0.0  | 0.9                                                                                 | 29.4                                                                                | 29.8 |
| Prop In Lane                 | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                   | 0.06 | 1.00                                                                              |                                                                                   | 0.10 | 1.00                                                                              |                                                                                   | 0.08 | 1.00                                                                                |                                                                                     | 0.11 |
| Lane Grp Cap(c), veh/h       | 256                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0                                                                                 | 304  | 252                                                                               | 0                                                                                 | 302  | 34                                                                                | 1312                                                                              | 1361 | 13                                                                                  | 1292                                                                                | 1335 |
| V/C Ratio(X)                 | 0.66                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.00                                                                              | 0.12 | 0.63                                                                              | 0.00                                                                              | 0.10 | 0.79                                                                              | 0.69                                                                              | 0.70 | 0.83                                                                                | 0.60                                                                                | 0.60 |
| Avail Cap(c_a), veh/h        | 303                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0                                                                                 | 368  | 299                                                                               | 0                                                                                 | 365  | 139                                                                               | 1312                                                                              | 1361 | 139                                                                                 | 1292                                                                                | 1335 |
| HCM Platoon Ratio            | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 2.00                                                                              | 2.00                                                                              | 2.00 | 1.00                                                                                | 1.00                                                                                | 1.00 |
| Upstream Filter(I)           | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.00                                                                              | 1.00 | 1.00                                                                              | 0.00                                                                              | 1.00 | 0.44                                                                              | 0.44                                                                              | 0.44 | 0.82                                                                                | 0.82                                                                                | 0.82 |
| Uniform Delay (d), s/veh     | 57.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.0                                                                               | 49.7 | 57.4                                                                              | 0.0                                                                               | 49.6 | 67.0                                                                              | 0.0                                                                               | 0.0  | 69.4                                                                                | 9.1                                                                                 | 9.2  |
| Incr Delay (d2), s/veh       | 3.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.0                                                                               | 0.2  | 3.1                                                                               | 0.0                                                                               | 0.1  | 6.8                                                                               | 1.4                                                                               | 1.4  | 31.3                                                                                | 1.7                                                                                 | 1.7  |
| Initial Q Delay(d3),s/veh    | 0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                                 | 0.0                                                                                 | 0.0  |
| %ile BackOfQ(50%),veh/ln     | 6.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.0                                                                               | 1.2  | 6.1                                                                               | 0.0                                                                               | 1.0  | 1.1                                                                               | 0.5                                                                               | 0.5  | 0.5                                                                                 | 14.8                                                                                | 15.6 |
| LnGrp Delay(d),s/veh         | 61.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.0                                                                               | 49.9 | 60.5                                                                              | 0.0                                                                               | 49.8 | 73.9                                                                              | 1.4                                                                               | 1.4  | 100.7                                                                               | 10.8                                                                                | 10.8 |
| LnGrp LOS                    | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                   | D    | E                                                                                 |                                                                                   | D    | E                                                                                 | A                                                                                 | A    | F                                                                                   | B                                                                                   | B    |
| Approach Vol, veh/h          | 203                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                   |      |                                                                                   |                                                                                   | 188  |                                                                                   | 1890                                                                              |      | 1591                                                                                |                                                                                     |      |
| Approach Delay, s/veh        | 59.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                   |      |                                                                                   |                                                                                   | 58.8 |                                                                                   | 2.4                                                                               |      | 11.4                                                                                |                                                                                     |      |
| Approach LOS                 | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                   |      |                                                                                   |                                                                                   | E    |                                                                                   | A                                                                                 |      | B                                                                                   |                                                                                     |      |
| Timer                        | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 2                                                                                 | 3    | 4                                                                                 | 5                                                                                 | 6    | 7                                                                                 | 8                                                                                 |      |                                                                                     |                                                                                     |      |
| Assigned Phs                 | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 2                                                                                 |      |                                                                                   | 4                                                                                 | 5    | 6                                                                                 | 8                                                                                 |      |                                                                                     |                                                                                     |      |
| Phs Duration (G+Y+Rc), s     | 6.7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 106.2                                                                             |      |                                                                                   | 27.1                                                                              | 5.0  | 107.8                                                                             | 27.1                                                                              |      |                                                                                     |                                                                                     |      |
| Change Period (Y+Rc), s      | 4.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 5.0                                                                               |      |                                                                                   | 5.0                                                                               | 4.0  | 5.0                                                                               | 5.0                                                                               |      |                                                                                     |                                                                                     |      |
| Max Green Setting (Gmax), s  | 11.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 88.0                                                                              |      |                                                                                   | 27.0                                                                              | 11.0 | 88.0                                                                              | 27.0                                                                              |      |                                                                                     |                                                                                     |      |
| Max Q Clear Time (g_c+14), s | 14.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 31.8                                                                              |      |                                                                                   | 20.1                                                                              | 2.9  | 2.0                                                                               | 20.8                                                                              |      |                                                                                     |                                                                                     |      |
| Green Ext Time (p_c), s      | 0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 28.5                                                                              |      |                                                                                   | 0.4                                                                               | 0.0  | 48.3                                                                              | 0.4                                                                               |      |                                                                                     |                                                                                     |      |
| Intersection Summary         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| HCM 2010 Ctrl Delay          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                   | 11.8 |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| HCM 2010 LOS                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                   | B    |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |



# HCM 2010 Signalized Intersection Summary

## 11: Honoapiilani Highway & Keawe Street

10/05/2017

|                              |  |      |      |      |      |      |      |      |      |      |      |      |
|------------------------------|------------------------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Movement                     | EBL                                                                                | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations          |                                                                                    | ↰    | ↱    | ↰    | ↱    | ↰    | ↰    | ↱    | ↱    | ↰    | ↱    | ↰    |
| Traffic Volume (veh/h)       | 15                                                                                 | 110  | 35   | 95   | 75   | 720  | 25   | 935  | 120  | 520  | 950  | 20   |
| Future Volume (veh/h)        | 15                                                                                 | 110  | 35   | 95   | 75   | 720  | 25   | 935  | 120  | 520  | 950  | 20   |
| Number                       | 7                                                                                  | 4    | 14   | 3    | 8    | 18   | 1    | 6    | 16   | 5    | 2    | 12   |
| Initial Q (Qb), veh          | 0                                                                                  | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                               |      | 0.99 | 0.99 |      | 0.99 | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Parking Bus, Adj             | 1.00                                                                               | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln       | 1900                                                                               | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h         | 16                                                                                 | 120  | 5    | 103  | 82   | 448  | 27   | 1016 | 53   | 565  | 1033 | 21   |
| Adj No. of Lanes             | 0                                                                                  | 1    | 1    | 1    | 1    | 1    | 1    | 2    | 1    | 2    | 2    | 0    |
| Peak Hour Factor             | 0.92                                                                               | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, %         | 2                                                                                  | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |
| Cap, veh/h                   | 53                                                                                 | 349  | 337  | 360  | 577  | 486  | 34   | 1504 | 670  | 619  | 2077 | 42   |
| Arrive On Green              | 0.22                                                                               | 0.22 | 0.22 | 0.07 | 0.31 | 0.31 | 0.02 | 0.42 | 0.42 | 0.36 | 1.00 | 1.00 |
| Sat Flow, veh/h              | 112                                                                                | 1623 | 1563 | 1774 | 1863 | 1570 | 1774 | 3539 | 1576 | 3442 | 3547 | 72   |
| Grp Volume(v), veh/h         | 136                                                                                | 0    | 5    | 103  | 82   | 448  | 27   | 1016 | 53   | 565  | 515  | 539  |
| Grp Sat Flow(s),veh/h/ln     | 1734                                                                               | 0    | 1563 | 1774 | 1863 | 1570 | 1774 | 1770 | 1576 | 1721 | 1770 | 1850 |
| Q Serve(g_s), s              | 0.0                                                                                | 0.0  | 0.4  | 6.1  | 4.5  | 38.6 | 2.1  | 32.4 | 2.8  | 21.9 | 0.0  | 0.0  |
| Cycle Q Clear(g_c), s        | 8.7                                                                                | 0.0  | 0.4  | 6.1  | 4.5  | 38.6 | 2.1  | 32.4 | 2.8  | 21.9 | 0.0  | 0.0  |
| Prop In Lane                 | 0.12                                                                               |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 0.04 |
| Lane Grp Cap(c), veh/h       | 402                                                                                | 0    | 337  | 360  | 577  | 486  | 34   | 1504 | 670  | 619  | 1036 | 1083 |
| V/C Ratio(X)                 | 0.34                                                                               | 0.00 | 0.01 | 0.29 | 0.14 | 0.92 | 0.79 | 0.68 | 0.08 | 0.91 | 0.50 | 0.50 |
| Avail Cap(c_a), veh/h        | 402                                                                                | 0    | 337  | 535  | 665  | 561  | 177  | 1504 | 670  | 836  | 1036 | 1083 |
| HCM Platoon Ratio            | 1.00                                                                               | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 |
| Upstream Filter(I)           | 1.00                                                                               | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.79 | 0.79 | 0.79 | 0.74 | 0.74 | 0.74 |
| Uniform Delay (d), s/veh     | 46.5                                                                               | 0.0  | 43.2 | 37.3 | 34.9 | 46.7 | 68.4 | 32.5 | 24.0 | 43.8 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh       | 0.5                                                                                | 0.0  | 0.0  | 0.4  | 0.1  | 19.3 | 11.4 | 1.9  | 0.2  | 7.6  | 1.3  | 1.2  |
| Initial Q Delay(d3),s/veh    | 0.0                                                                                | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln     | 4.5                                                                                | 0.0  | 0.2  | 3.0  | 2.3  | 19.4 | 1.2  | 16.2 | 1.3  | 11.0 | 0.4  | 0.4  |
| LnGrp Delay(d),s/veh         | 47.0                                                                               | 0.0  | 43.2 | 37.8 | 35.0 | 66.0 | 79.8 | 34.4 | 24.1 | 51.4 | 1.3  | 1.2  |
| LnGrp LOS                    | D                                                                                  |      | D    | D    | D    | E    | E    | C    | C    | D    | A    | A    |
| Approach Vol, veh/h          |                                                                                    | 141  |      |      | 633  |      |      | 1096 |      |      | 1619 |      |
| Approach Delay, s/veh        |                                                                                    | 46.8 |      |      | 57.4 |      |      | 35.0 |      |      | 18.8 |      |
| Approach LOS                 |                                                                                    | D    |      |      | E    |      |      | D    |      |      | B    |      |
| Timer                        | 1                                                                                  | 2    | 3    | 4    | 5    | 6    | 7    | 8    |      |      |      |      |
| Assigned Phs                 | 1                                                                                  | 2    | 3    | 4    | 5    | 6    |      | 8    |      |      |      |      |
| Phs Duration (G+Y+Rc), s     | 6.7                                                                                | 86.0 | 13.2 | 34.2 | 29.2 | 63.5 |      | 47.3 |      |      |      |      |
| Change Period (Y+Rc), s      | 4.0                                                                                | 5.0  | 5.0  | 5.0  | 4.0  | 5.0  |      | 5.0  |      |      |      |      |
| Max Green Setting (Gmax), s  | 14.0                                                                               | 63.0 | 22.0 | 22.0 | 34.0 | 43.0 |      | 49.0 |      |      |      |      |
| Max Q Clear Time (g_c+14), s | 14.1                                                                               | 2.0  | 8.1  | 10.7 | 23.9 | 34.4 |      | 40.6 |      |      |      |      |
| Green Ext Time (p_c), s      | 0.0                                                                                | 14.1 | 0.3  | 0.4  | 1.3  | 5.5  |      | 1.7  |      |      |      |      |
| Intersection Summary         |                                                                                    |      |      |      |      |      |      |      |      |      |      |      |
| HCM 2010 Ctrl Delay          |                                                                                    |      | 32.0 |      |      |      |      |      |      |      |      |      |
| HCM 2010 LOS                 |                                                                                    |      | C    |      |      |      |      |      |      |      |      |      |
| Notes                        |                                                                                    |      |      |      |      |      |      |      |      |      |      |      |



HCM 2010 TWSC  
12: RIRO Access & Honoapiilani Highway

10/05/2017

| Intersection             |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
|--------------------------|--------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh         | 0.1    |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
| Movement                 | WBL    | WBR                                                                               | NBT                                                                               | NBR                                                                               | SBL    | SBT                                                                                 |
| Lane Configurations      |        |  |  |  |        |  |
| Traffic Vol, veh/h       | 0      | 15                                                                                | 780                                                                               | 25                                                                                | 0      | 915                                                                                 |
| Future Vol, veh/h        | 0      | 15                                                                                | 780                                                                               | 25                                                                                | 0      | 915                                                                                 |
| Conflicting Peds, #/hr   | 0      | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0      | 0                                                                                   |
| Sign Control             | Stop   | Stop                                                                              | Free                                                                              | Free                                                                              | Free   | Free                                                                                |
| RT Channelized           | -      | None                                                                              | -                                                                                 | None                                                                              | -      | None                                                                                |
| Storage Length           | -      | 0                                                                                 | -                                                                                 | 0                                                                                 | -      | -                                                                                   |
| Veh in Median Storage, # | 0      | -                                                                                 | 0                                                                                 | -                                                                                 | -      | 0                                                                                   |
| Grade, %                 | 0      | -                                                                                 | 0                                                                                 | -                                                                                 | -      | 0                                                                                   |
| Peak Hour Factor         | 92     | 92                                                                                | 92                                                                                | 92                                                                                | 92     | 92                                                                                  |
| Heavy Vehicles, %        | 2      | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2      | 2                                                                                   |
| Mvmt Flow                | 0      | 16                                                                                | 848                                                                               | 27                                                                                | 0      | 995                                                                                 |
|                          |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
| Major/Minor              | Minor1 |                                                                                   | Major1                                                                            |                                                                                   | Major2 |                                                                                     |
| Conflicting Flow All     | -      | 848                                                                               | 0                                                                                 | 0                                                                                 | -      | -                                                                                   |
| Stage 1                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Stage 2                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Critical Hdwy            | -      | 6.22                                                                              | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Critical Hdwy Stg 1      | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Critical Hdwy Stg 2      | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Follow-up Hdwy           | -      | 3.318                                                                             | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Pot Cap-1 Maneuver       | 0      | 361                                                                               | -                                                                                 | -                                                                                 | 0      | -                                                                                   |
| Stage 1                  | 0      | -                                                                                 | -                                                                                 | -                                                                                 | 0      | -                                                                                   |
| Stage 2                  | 0      | -                                                                                 | -                                                                                 | -                                                                                 | 0      | -                                                                                   |
| Platoon blocked, %       |        |                                                                                   | -                                                                                 | -                                                                                 |        | -                                                                                   |
| Mov Cap-1 Maneuver       | -      | 361                                                                               | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Mov Cap-2 Maneuver       | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Stage 1                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Stage 2                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
|                          |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
| Approach                 | WB     |                                                                                   | NB                                                                                |                                                                                   | SB     |                                                                                     |
| HCM Control Delay, s     | 15.4   |                                                                                   | 0                                                                                 |                                                                                   | 0      |                                                                                     |
| HCM LOS                  | C      |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
|                          |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
| Minor Lane/Major Mvmt    | NBT    | NBRWBLn1                                                                          | SBT                                                                               |                                                                                   |        |                                                                                     |
| Capacity (veh/h)         | -      | - 361                                                                             | -                                                                                 |                                                                                   |        |                                                                                     |
| HCM Lane V/C Ratio       | -      | - 0.045                                                                           | -                                                                                 |                                                                                   |        |                                                                                     |
| HCM Control Delay (s)    | -      | - 15.4                                                                            | -                                                                                 |                                                                                   |        |                                                                                     |
| HCM Lane LOS             | -      | - C                                                                               | -                                                                                 |                                                                                   |        |                                                                                     |
| HCM 95th %tile Q(veh)    | -      | - 0.1                                                                             | -                                                                                 |                                                                                   |        |                                                                                     |

HCM 2010 TWSC  
13: Honoapiilani Highway & Road J

10/05/2017

| Intersection                                                                                                         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
|----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh                                                                                                     | 1.5                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Movement                                                                                                             | WBL                                                                               | WBR                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 |
| Lane Configurations                                                                                                  |  |  |  |  |  |  |
| Traffic Vol, veh/h                                                                                                   | 65                                                                                | 35                                                                                | 785                                                                               | 20                                                                                | 10                                                                                  | 990                                                                                 |
| Future Vol, veh/h                                                                                                    | 65                                                                                | 35                                                                                | 785                                                                               | 20                                                                                | 10                                                                                  | 990                                                                                 |
| Conflicting Peds, #/hr                                                                                               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   |
| Sign Control                                                                                                         | Stop                                                                              | Stop                                                                              | Free                                                                              | Free                                                                              | Free                                                                                | Free                                                                                |
| RT Channelized                                                                                                       | -                                                                                 | None                                                                              | -                                                                                 | None                                                                              | -                                                                                   | None                                                                                |
| Storage Length                                                                                                       | 0                                                                                 | 100                                                                               | -                                                                                 | 100                                                                               | 100                                                                                 | -                                                                                   |
| Veh in Median Storage, #                                                                                             | 0                                                                                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                   | 0                                                                                   |
| Grade, %                                                                                                             | 0                                                                                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                   | 0                                                                                   |
| Peak Hour Factor                                                                                                     | 92                                                                                | 92                                                                                | 92                                                                                | 92                                                                                | 92                                                                                  | 92                                                                                  |
| Heavy Vehicles, %                                                                                                    | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   |
| Mvmt Flow                                                                                                            | 71                                                                                | 38                                                                                | 853                                                                               | 22                                                                                | 11                                                                                  | 1076                                                                                |
|                                                                                                                      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Major/Minor                                                                                                          | Minor1                                                                            |                                                                                   | Major1                                                                            |                                                                                   | Major2                                                                              |                                                                                     |
| Conflicting Flow All                                                                                                 | 1951                                                                              | 853                                                                               | 0                                                                                 | 0                                                                                 | 875                                                                                 | 0                                                                                   |
| Stage 1                                                                                                              | 853                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 2                                                                                                              | 1098                                                                              | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Critical Hdwy                                                                                                        | 6.42                                                                              | 6.22                                                                              | -                                                                                 | -                                                                                 | 4.12                                                                                | -                                                                                   |
| Critical Hdwy Stg 1                                                                                                  | 5.42                                                                              | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Critical Hdwy Stg 2                                                                                                  | 5.42                                                                              | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Follow-up Hdwy                                                                                                       | 3.518                                                                             | 3.318                                                                             | -                                                                                 | -                                                                                 | 2.218                                                                               | -                                                                                   |
| Pot Cap-1 Maneuver                                                                                                   | 71                                                                                | 359                                                                               | -                                                                                 | -                                                                                 | 771                                                                                 | -                                                                                   |
| Stage 1                                                                                                              | 418                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 2                                                                                                              | 319                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Platoon blocked, %                                                                                                   |                                                                                   |                                                                                   | -                                                                                 | -                                                                                 |                                                                                     | -                                                                                   |
| Mov Cap-1 Maneuver                                                                                                   | ~ 70                                                                              | 359                                                                               | -                                                                                 | -                                                                                 | 771                                                                                 | -                                                                                   |
| Mov Cap-2 Maneuver                                                                                                   | 192                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 1                                                                                                              | 412                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 2                                                                                                              | 319                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
|                                                                                                                      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Approach                                                                                                             | WB                                                                                |                                                                                   | NB                                                                                |                                                                                   | SB                                                                                  |                                                                                     |
| HCM Control Delay, s                                                                                                 | 28                                                                                |                                                                                   | 0                                                                                 |                                                                                   | 0.1                                                                                 |                                                                                     |
| HCM LOS                                                                                                              | D                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
|                                                                                                                      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Minor Lane/Major Mvmt                                                                                                | NBT                                                                               | NBR                                                                               | WBLn1                                                                             | WBLn2                                                                             | SBL                                                                                 | SBT                                                                                 |
| Capacity (veh/h)                                                                                                     | -                                                                                 | -                                                                                 | 192                                                                               | 359                                                                               | 771                                                                                 | -                                                                                   |
| HCM Lane V/C Ratio                                                                                                   | -                                                                                 | -                                                                                 | 0.368                                                                             | 0.106                                                                             | 0.014                                                                               | -                                                                                   |
| HCM Control Delay (s)                                                                                                | -                                                                                 | -                                                                                 | 34.3                                                                              | 16.2                                                                              | 9.7                                                                                 | -                                                                                   |
| HCM Lane LOS                                                                                                         | -                                                                                 | -                                                                                 | D                                                                                 | C                                                                                 | A                                                                                   | -                                                                                   |
| HCM 95th %tile Q(veh)                                                                                                | -                                                                                 | -                                                                                 | 1.6                                                                               | 0.4                                                                               | 0                                                                                   | -                                                                                   |
|                                                                                                                      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Notes                                                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    *: All major volume in platoon |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |

HCM 2010 TWSC  
14: Road A & Akahele Street

10/05/2017

| Intersection             |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|--------|-------------------------------------------------------------------------------------|-------|--------|-------------------------------------------------------------------------------------|-------|
| Int Delay, s/veh         | 6.8                                                                               |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Movement                 | EBL                                                                               | EBT                                                                               | EBR  | WBL                                                                               | WBT                                                                               | WBR  | NBL    | NBT                                                                                 | NBR   | SBL    | SBT                                                                                 | SBR   |
| Lane Configurations      |  |  |      |  |  |      |        |  |       |        |  |       |
| Traffic Vol, veh/h       | 45                                                                                | 40                                                                                | 200  | 5                                                                                 | 105                                                                               | 5    | 185    | 5                                                                                   | 5     | 5      | 5                                                                                   | 65    |
| Future Vol, veh/h        | 45                                                                                | 40                                                                                | 200  | 5                                                                                 | 105                                                                               | 5    | 185    | 5                                                                                   | 5     | 5      | 5                                                                                   | 65    |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0      | 0                                                                                   | 0     | 0      | 0                                                                                   | 0     |
| Sign Control             | Free                                                                              | Free                                                                              | Free | Free                                                                              | Free                                                                              | Free | Stop   | Stop                                                                                | Stop  | Stop   | Stop                                                                                | Stop  |
| RT Channelized           | -                                                                                 | -                                                                                 | None | -                                                                                 | -                                                                                 | None | -      | -                                                                                   | None  | -      | -                                                                                   | None  |
| Storage Length           | 100                                                                               | -                                                                                 | -    | 100                                                                               | -                                                                                 | -    | -      | -                                                                                   | -     | -      | -                                                                                   | -     |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | -    | -                                                                                 | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Grade, %                 | -                                                                                 | 0                                                                                 | -    | -                                                                                 | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Peak Hour Factor         | 92                                                                                | 92                                                                                | 92   | 92                                                                                | 92                                                                                | 92   | 92     | 92                                                                                  | 92    | 92     | 92                                                                                  | 92    |
| Heavy Vehicles, %        | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    | 2      | 2                                                                                   | 2     | 2      | 2                                                                                   | 2     |
| Mvmt Flow                | 49                                                                                | 43                                                                                | 217  | 5                                                                                 | 114                                                                               | 5    | 201    | 5                                                                                   | 5     | 5      | 5                                                                                   | 71    |
|                          |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Major/Minor              | Major1                                                                            |                                                                                   |      | Major2                                                                            |                                                                                   |      | Minor1 |                                                                                     |       | Minor2 |                                                                                     |       |
| Conflicting Flow All     | 119                                                                               | 0                                                                                 | 0    | 260                                                                               | 0                                                                                 | 0    | 415    | 379                                                                                 | 152   | 382    | 485                                                                                 | 117   |
| Stage 1                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 250    | 250                                                                                 | -     | 127    | 127                                                                                 | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 165    | 129                                                                                 | -     | 255    | 358                                                                                 | -     |
| Critical Hdwy            | 4.12                                                                              | -                                                                                 | -    | 4.12                                                                              | -                                                                                 | -    | 7.12   | 6.52                                                                                | 6.22  | 7.12   | 6.52                                                                                | 6.22  |
| Critical Hdwy Stg 1      | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Critical Hdwy Stg 2      | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Follow-up Hdwy           | 2.218                                                                             | -                                                                                 | -    | 2.218                                                                             | -                                                                                 | -    | 3.518  | 4.018                                                                               | 3.318 | 3.518  | 4.018                                                                               | 3.318 |
| Pot Cap-1 Maneuver       | 1469                                                                              | -                                                                                 | -    | 1304                                                                              | -                                                                                 | -    | 548    | 553                                                                                 | 894   | 576    | 482                                                                                 | 935   |
| Stage 1                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 754    | 700                                                                                 | -     | 877    | 791                                                                                 | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 837    | 789                                                                                 | -     | 749    | 628                                                                                 | -     |
| Platoon blocked, %       |                                                                                   | -                                                                                 | -    |                                                                                   | -                                                                                 | -    |        |                                                                                     |       |        |                                                                                     |       |
| Mov Cap-1 Maneuver       | 1469                                                                              | -                                                                                 | -    | 1304                                                                              | -                                                                                 | -    | 488    | 533                                                                                 | 894   | 552    | 464                                                                                 | 935   |
| Mov Cap-2 Maneuver       | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 488    | 533                                                                                 | -     | 552    | 464                                                                                 | -     |
| Stage 1                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 729    | 677                                                                                 | -     | 848    | 788                                                                                 | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 765    | 786                                                                                 | -     | 714    | 607                                                                                 | -     |
|                          |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Approach                 | EB                                                                                |                                                                                   |      | WB                                                                                |                                                                                   |      | NB     |                                                                                     |       | SB     |                                                                                     |       |
| HCM Control Delay, s     | 1.2                                                                               |                                                                                   |      | 0.3                                                                               |                                                                                   |      | 17.6   |                                                                                     |       | 9.8    |                                                                                     |       |
| HCM LOS                  |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      | C      |                                                                                     |       | A      |                                                                                     |       |
|                          |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Minor Lane/Major Mvmt    | NBLn1                                                                             | EBL                                                                               | EBT  | EBR                                                                               | WBL                                                                               | WBT  | WBR    | SBLn1                                                                               |       |        |                                                                                     |       |
| Capacity (veh/h)         | 495                                                                               | 1469                                                                              | -    | -                                                                                 | 1304                                                                              | -    | -      | 839                                                                                 |       |        |                                                                                     |       |
| HCM Lane V/C Ratio       | 0.428                                                                             | 0.033                                                                             | -    | -                                                                                 | 0.004                                                                             | -    | -      | 0.097                                                                               |       |        |                                                                                     |       |
| HCM Control Delay (s)    | 17.6                                                                              | 7.5                                                                               | -    | -                                                                                 | 7.8                                                                               | -    | -      | 9.8                                                                                 |       |        |                                                                                     |       |
| HCM Lane LOS             | C                                                                                 | A                                                                                 | -    | -                                                                                 | A                                                                                 | -    | -      | A                                                                                   |       |        |                                                                                     |       |
| HCM 95th %tile O(veh)    | 2.1                                                                               | 0.1                                                                               | -    | -                                                                                 | 0                                                                                 | -    | -      | 0.3                                                                                 |       |        |                                                                                     |       |

| Intersection             |        |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
|--------------------------|--------|-----------------------------------------------------------------------------------|------|--------|-----------------------------------------------------------------------------------|------|--------|-------------------------------------------------------------------------------------|-------|--------|-------------------------------------------------------------------------------------|-------|
| Int Delay, s/veh         | 6.5    |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Movement                 | EBL    | EBT                                                                               | EBR  | WBL    | WBT                                                                               | WBR  | NBL    | NBT                                                                                 | NBR   | SBL    | SBT                                                                                 | SBR   |
| Lane Configurations      |        |  |      |        |  |      |        |  |       |        |  |       |
| Traffic Vol, veh/h       | 10     | 20                                                                                | 20   | 5      | 10                                                                                | 5    | 70     | 5                                                                                   | 5     | 5      | 5                                                                                   | 25    |
| Future Vol, veh/h        | 10     | 20                                                                                | 20   | 5      | 10                                                                                | 5    | 70     | 5                                                                                   | 5     | 5      | 5                                                                                   | 25    |
| Conflicting Peds, #/hr   | 0      | 0                                                                                 | 0    | 0      | 0                                                                                 | 0    | 0      | 0                                                                                   | 0     | 0      | 0                                                                                   | 0     |
| Sign Control             | Free   | Free                                                                              | Free | Free   | Free                                                                              | Free | Stop   | Stop                                                                                | Stop  | Stop   | Stop                                                                                | Stop  |
| RT Channelized           | -      | -                                                                                 | None | -      | -                                                                                 | None | -      | -                                                                                   | None  | -      | -                                                                                   | None  |
| Storage Length           | -      | -                                                                                 | -    | -      | -                                                                                 | -    | -      | -                                                                                   | -     | -      | -                                                                                   | -     |
| Veh in Median Storage, # | -      | 0                                                                                 | -    | -      | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Grade, %                 | -      | 0                                                                                 | -    | -      | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Peak Hour Factor         | 92     | 92                                                                                | 92   | 92     | 92                                                                                | 92   | 92     | 92                                                                                  | 92    | 92     | 92                                                                                  | 92    |
| Heavy Vehicles, %        | 2      | 2                                                                                 | 2    | 2      | 2                                                                                 | 2    | 2      | 2                                                                                   | 2     | 2      | 2                                                                                   | 2     |
| Mvmt Flow                | 11     | 22                                                                                | 22   | 5      | 11                                                                                | 5    | 76     | 5                                                                                   | 5     | 5      | 5                                                                                   | 27    |
|                          |        |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Major/Minor              | Major1 |                                                                                   |      | Major2 |                                                                                   |      | Minor1 |                                                                                     |       | Minor2 |                                                                                     |       |
| Conflicting Flow All     | 16     | 0                                                                                 | 0    | 44     | 0                                                                                 | 0    | 95     | 81                                                                                  | 33    | 84     | 90                                                                                  | 14    |
| Stage 1                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 55     | 55                                                                                  | -     | 24     | 24                                                                                  | -     |
| Stage 2                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 40     | 26                                                                                  | -     | 60     | 66                                                                                  | -     |
| Critical Hdwy            | 4.12   | -                                                                                 | -    | 4.12   | -                                                                                 | -    | 7.12   | 6.52                                                                                | 6.22  | 7.12   | 6.52                                                                                | 6.22  |
| Critical Hdwy Stg 1      | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Critical Hdwy Stg 2      | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Follow-up Hdwy           | 2.218  | -                                                                                 | -    | 2.218  | -                                                                                 | -    | 3.518  | 4.018                                                                               | 3.318 | 3.518  | 4.018                                                                               | 3.318 |
| Pot Cap-1 Maneuver       | 1602   | -                                                                                 | -    | 1564   | -                                                                                 | -    | 888    | 809                                                                                 | 1041  | 903    | 800                                                                                 | 1066  |
| Stage 1                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 957    | 849                                                                                 | -     | 994    | 875                                                                                 | -     |
| Stage 2                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 975    | 874                                                                                 | -     | 951    | 840                                                                                 | -     |
| Platoon blocked, %       |        | -                                                                                 | -    |        | -                                                                                 | -    |        |                                                                                     |       |        |                                                                                     |       |
| Mov Cap-1 Maneuver       | 1602   | -                                                                                 | -    | 1564   | -                                                                                 | -    | 854    | 801                                                                                 | 1041  | 887    | 792                                                                                 | 1066  |
| Mov Cap-2 Maneuver       | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 854    | 801                                                                                 | -     | 887    | 792                                                                                 | -     |
| Stage 1                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 950    | 843                                                                                 | -     | 987    | 872                                                                                 | -     |
| Stage 2                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 941    | 871                                                                                 | -     | 933    | 834                                                                                 | -     |
|                          |        |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Approach                 | EB     |                                                                                   |      | WB     |                                                                                   |      | NB     |                                                                                     |       | SB     |                                                                                     |       |
| HCM Control Delay, s     | 1.5    |                                                                                   |      | 1.8    |                                                                                   |      | 9.7    |                                                                                     |       | 8.8    |                                                                                     |       |
| HCM LOS                  |        |                                                                                   |      |        |                                                                                   |      | A      |                                                                                     |       | A      |                                                                                     |       |
|                          |        |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Minor Lane/Major Mvmt    | NBLn1  | EBL                                                                               | EBT  | EBR    | WBL                                                                               | WBT  | WBR    | SBLn1                                                                               |       |        |                                                                                     |       |
| Capacity (veh/h)         | 860    | 1602                                                                              | -    | -      | 1564                                                                              | -    | -      | 989                                                                                 |       |        |                                                                                     |       |
| HCM Lane V/C Ratio       | 0.101  | 0.007                                                                             | -    | -      | 0.003                                                                             | -    | -      | 0.038                                                                               |       |        |                                                                                     |       |
| HCM Control Delay (s)    | 9.7    | 7.3                                                                               | 0    | -      | 7.3                                                                               | 0    | -      | 8.8                                                                                 |       |        |                                                                                     |       |
| HCM Lane LOS             | A      | A                                                                                 | A    | -      | A                                                                                 | A    | -      | A                                                                                   |       |        |                                                                                     |       |
| HCM 95th %tile Q(veh)    | 0.3    | 0                                                                                 | -    | -      | 0                                                                                 | -    | -      | 0.1                                                                                 |       |        |                                                                                     |       |

| Intersection             |                                                                                   |      |        |                                                                                   |                                                                                     |       |
|--------------------------|-----------------------------------------------------------------------------------|------|--------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------|
| Int Delay, s/veh         | 2.1                                                                               |      |        |                                                                                   |                                                                                     |       |
| Movement                 | EBT                                                                               | EBR  | WBL    | WBT                                                                               | NBL                                                                                 | NBR   |
| Lane Configurations      |  |      |        |  |  |       |
| Traffic Vol, veh/h       | 20                                                                                | 10   | 5      | 75                                                                                | 25                                                                                  | 5     |
| Future Vol, veh/h        | 20                                                                                | 10   | 5      | 75                                                                                | 25                                                                                  | 5     |
| Conflicting Peds, #/hr   | 0                                                                                 | 0    | 0      | 0                                                                                 | 0                                                                                   | 0     |
| Sign Control             | Free                                                                              | Free | Free   | Free                                                                              | Stop                                                                                | Stop  |
| RT Channelized           | -                                                                                 | None | -      | None                                                                              | -                                                                                   | Stop  |
| Storage Length           | -                                                                                 | -    | -      | -                                                                                 | 0                                                                                   | -     |
| Veh in Median Storage, # | 0                                                                                 | -    | -      | 0                                                                                 | 0                                                                                   | -     |
| Grade, %                 | 0                                                                                 | -    | -      | 0                                                                                 | 0                                                                                   | -     |
| Peak Hour Factor         | 92                                                                                | 92   | 92     | 92                                                                                | 92                                                                                  | 92    |
| Heavy Vehicles, %        | 2                                                                                 | 2    | 2      | 2                                                                                 | 2                                                                                   | 2     |
| Mvmt Flow                | 22                                                                                | 11   | 5      | 82                                                                                | 27                                                                                  | 5     |
| Major/Minor              | Major1                                                                            |      | Major2 |                                                                                   | Minor1                                                                              |       |
| Conflicting Flow All     | 0                                                                                 | 0    | 33     | 0                                                                                 | 120                                                                                 | 28    |
| Stage 1                  | -                                                                                 | -    | -      | -                                                                                 | 28                                                                                  | -     |
| Stage 2                  | -                                                                                 | -    | -      | -                                                                                 | 92                                                                                  | -     |
| Critical Hdwy            | -                                                                                 | -    | 4.12   | -                                                                                 | 6.42                                                                                | 6.22  |
| Critical Hdwy Stg 1      | -                                                                                 | -    | -      | -                                                                                 | 5.42                                                                                | -     |
| Critical Hdwy Stg 2      | -                                                                                 | -    | -      | -                                                                                 | 5.42                                                                                | -     |
| Follow-up Hdwy           | -                                                                                 | -    | 2.218  | -                                                                                 | 3.518                                                                               | 3.318 |
| Pot Cap-1 Maneuver       | -                                                                                 | -    | 1579   | -                                                                                 | 876                                                                                 | 1047  |
| Stage 1                  | -                                                                                 | -    | -      | -                                                                                 | 995                                                                                 | -     |
| Stage 2                  | -                                                                                 | -    | -      | -                                                                                 | 932                                                                                 | -     |
| Platoon blocked, %       | -                                                                                 | -    | -      | -                                                                                 | -                                                                                   | -     |
| Mov Cap-1 Maneuver       | -                                                                                 | -    | 1579   | -                                                                                 | 873                                                                                 | 1047  |
| Mov Cap-2 Maneuver       | -                                                                                 | -    | -      | -                                                                                 | 873                                                                                 | -     |
| Stage 1                  | -                                                                                 | -    | -      | -                                                                                 | 992                                                                                 | -     |
| Stage 2                  | -                                                                                 | -    | -      | -                                                                                 | 932                                                                                 | -     |
| Approach                 | EB                                                                                |      | WB     |                                                                                   | NB                                                                                  |       |
| HCM Control Delay, s     | 0                                                                                 |      | 0.5    |                                                                                   | 8.5                                                                                 |       |
| HCM LOS                  |                                                                                   |      |        |                                                                                   | A                                                                                   |       |
| Minor Lane/Major Mvmt    | NBLn1                                                                             | EBT  | EBR    | WBL                                                                               | WBT                                                                                 |       |
| Capacity (veh/h)         | 1048                                                                              | -    | -      | 1579                                                                              | -                                                                                   |       |
| HCM Lane V/C Ratio       | 0.031                                                                             | -    | -      | 0.003                                                                             | -                                                                                   |       |
| HCM Control Delay (s)    | 8.5                                                                               | -    | -      | 7.3                                                                               | 0                                                                                   |       |
| HCM Lane LOS             | A                                                                                 | -    | -      | A                                                                                 | A                                                                                   |       |
| HCM 95th %tile Q(veh)    | 0.1                                                                               | -    | -      | 0                                                                                 | -                                                                                   |       |

HCM 2010 Roundabout  
17: Road F & Road J

10/05/2017

| Intersection                |       |       |       |
|-----------------------------|-------|-------|-------|
| Intersection Delay, s/veh   | 3.6   |       |       |
| Intersection LOS            | A     |       |       |
| Approach                    | EB    | WB    | NB    |
| Entry Lanes                 | 1     | 1     | 1     |
| Conflicting Circle Lanes    | 1     | 1     | 1     |
| Adj Approach Flow, veh/h    | 27    | 48    | 43    |
| Demand Flow Rate, veh/h     | 27    | 49    | 44    |
| Vehicles Circulating, veh/h | 5     | 39    | 16    |
| Vehicles Exiting, veh/h     | 83    | 21    | 16    |
| Follow-Up Headway, s        | 3.186 | 3.186 | 3.186 |
| Ped Vol Crossing Leg, #/h   | 0     | 0     | 0     |
| Ped Cap Adj                 | 1.000 | 1.000 | 1.000 |
| Approach Delay, s/veh       | 3.4   | 3.8   | 3.6   |
| Approach LOS                | A     | A     | A     |
| Lane                        | Left  | Left  | Left  |
| Designated Moves            | TR    | LT    | LR    |
| Assumed Moves               | TR    | LT    | LR    |
| RT Channelized              |       |       |       |
| Lane Util                   | 1.000 | 1.000 | 1.000 |
| Critical Headway, s         | 5.193 | 5.193 | 5.193 |
| Entry Flow, veh/h           | 27    | 49    | 44    |
| Cap Entry Lane, veh/h       | 1124  | 1087  | 1112  |
| Entry HV Adj Factor         | 0.988 | 0.982 | 0.977 |
| Flow Entry, veh/h           | 27    | 48    | 43    |
| Cap Entry, veh/h            | 1111  | 1068  | 1087  |
| V/C Ratio                   | 0.024 | 0.045 | 0.040 |
| Control Delay, s/veh        | 3.4   | 3.8   | 3.6   |
| LOS                         | A     | A     | A     |
| 95th %tile Queue, veh       | 0     | 0     | 0     |



---

## **APPENDIX C**

### **LEVEL OF SERVICE CALCULATIONS**

- Future Year 2027 Scenario 4 PM Peak
-

# HCM 2010 Signalized Intersection Summary

## 1: Napilihau Street

10/05/2017

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 55                                                                                | 25                                                                                | 420                                                                               | 65                                                                                | 25                                                                                | 5                                                                                 | 420                                                                                | 300                                                                                 | 70                                                                                  | 10                                                                                  | 410                                                                                 | 75                                                                                  |
| Future Volume (veh/h)        | 55                                                                                | 25                                                                                | 420                                                                               | 65                                                                                | 25                                                                                | 5                                                                                 | 420                                                                                | 300                                                                                 | 70                                                                                  | 10                                                                                  | 410                                                                                 | 75                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                  | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 60                                                                                | 27                                                                                | 27                                                                                | 71                                                                                | 27                                                                                | 1                                                                                 | 457                                                                                | 326                                                                                 | 50                                                                                  | 11                                                                                  | 446                                                                                 | 25                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 199                                                                               | 73                                                                                | 181                                                                               | 198                                                                               | 204                                                                               | 8                                                                                 | 523                                                                                | 1169                                                                                | 994                                                                                 | 15                                                                                  | 636                                                                                 | 540                                                                                 |
| Arrive On Green              | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.29                                                                               | 0.63                                                                                | 0.63                                                                                | 0.01                                                                                | 0.34                                                                                | 0.34                                                                                |
| Sat Flow, veh/h              | 908                                                                               | 634                                                                               | 1583                                                                              | 1345                                                                              | 1785                                                                              | 66                                                                                | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h         | 87                                                                                | 0                                                                                 | 27                                                                                | 71                                                                                | 0                                                                                 | 28                                                                                | 457                                                                                | 326                                                                                 | 50                                                                                  | 11                                                                                  | 446                                                                                 | 25                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1542                                                                              | 0                                                                                 | 1583                                                                              | 1345                                                                              | 0                                                                                 | 1851                                                                              | 1774                                                                               | 1863                                                                                | 1583                                                                                | 1774                                                                                | 1863                                                                                | 1583                                                                                |
| Q Serve(g_s), s              | 2.4                                                                               | 0.0                                                                               | 1.0                                                                               | 3.3                                                                               | 0.0                                                                               | 0.9                                                                               | 15.7                                                                               | 5.1                                                                                 | 0.8                                                                                 | 0.4                                                                                 | 13.3                                                                                | 0.7                                                                                 |
| Cycle Q Clear(g_c), s        | 3.3                                                                               | 0.0                                                                               | 1.0                                                                               | 6.6                                                                               | 0.0                                                                               | 0.9                                                                               | 15.7                                                                               | 5.1                                                                                 | 0.8                                                                                 | 0.4                                                                                 | 13.3                                                                                | 0.7                                                                                 |
| Prop In Lane                 | 0.69                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.04                                                                              | 1.00                                                                               |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 272                                                                               | 0                                                                                 | 181                                                                               | 198                                                                               | 0                                                                                 | 212                                                                               | 523                                                                                | 1169                                                                                | 994                                                                                 | 15                                                                                  | 636                                                                                 | 540                                                                                 |
| V/C Ratio(X)                 | 0.32                                                                              | 0.00                                                                              | 0.15                                                                              | 0.36                                                                              | 0.00                                                                              | 0.13                                                                              | 0.87                                                                               | 0.28                                                                                | 0.05                                                                                | 0.74                                                                                | 0.70                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h        | 661                                                                               | 0                                                                                 | 593                                                                               | 547                                                                               | 0                                                                                 | 693                                                                               | 830                                                                                | 2296                                                                                | 1952                                                                                | 415                                                                                 | 1860                                                                                | 1581                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 26.5                                                                              | 0.0                                                                               | 25.6                                                                              | 29.7                                                                              | 0.0                                                                               | 25.5                                                                              | 21.5                                                                               | 5.4                                                                                 | 4.6                                                                                 | 31.7                                                                                | 18.3                                                                                | 14.1                                                                                |
| Incr Delay (d2), s/veh       | 0.7                                                                               | 0.0                                                                               | 0.4                                                                               | 1.1                                                                               | 0.0                                                                               | 0.3                                                                               | 6.4                                                                                | 0.3                                                                                 | 0.0                                                                                 | 52.7                                                                                | 3.0                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.5                                                                               | 0.0                                                                               | 0.4                                                                               | 1.3                                                                               | 0.0                                                                               | 0.5                                                                               | 8.5                                                                                | 2.6                                                                                 | 0.3                                                                                 | 0.4                                                                                 | 7.3                                                                                 | 0.3                                                                                 |
| LnGrp Delay(d),s/veh         | 27.2                                                                              | 0.0                                                                               | 25.9                                                                              | 30.8                                                                              | 0.0                                                                               | 25.8                                                                              | 27.8                                                                               | 5.7                                                                                 | 4.6                                                                                 | 84.4                                                                                | 21.3                                                                                | 14.2                                                                                |
| LnGrp LOS                    | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                  | A                                                                                   | A                                                                                   | F                                                                                   | C                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 114                                                                               |                                                                                   |                                                                                   | 99                                                                                |                                                                                   |                                                                                    | 833                                                                                 |                                                                                     |                                                                                     | 482                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 26.9                                                                              |                                                                                   |                                                                                   | 29.4                                                                              |                                                                                   |                                                                                    | 17.8                                                                                |                                                                                     |                                                                                     | 22.4                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                  | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                    | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.5                                                                               | 46.2                                                                              |                                                                                   | 12.3                                                                              | 23.9                                                                              | 27.9                                                                              |                                                                                    | 12.3                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                    | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 79.0                                                                              |                                                                                   | 24.0                                                                              | 30.0                                                                              | 64.0                                                                              |                                                                                    | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.4                                                                               | 7.1                                                                               |                                                                                   | 5.3                                                                               | 17.7                                                                              | 15.3                                                                              |                                                                                    | 8.6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 4.9                                                                               |                                                                                   | 0.5                                                                               | 1.2                                                                               | 6.6                                                                               |                                                                                    | 0.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 20.6                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 2: Hoohui Road

10/05/2017

|                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                              |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 75                                                                                | 20                                                                                | 175                                                                               | 55                                                                                | 15                                                                                | 10                                                                                | 220                                                                               | 725                                                                               | 50                                                                                | 25                                                                                  | 770                                                                                 | 80                                                                                  |
| Future Volume (veh/h)        | 75                                                                                | 20                                                                                | 175                                                                               | 55                                                                                | 15                                                                                | 10                                                                                | 220                                                                               | 725                                                                               | 50                                                                                | 25                                                                                  | 770                                                                                 | 80                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                 | 2                                                                                 | 12                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 82                                                                                | 22                                                                                | 11                                                                                | 60                                                                                | 16                                                                                | 1                                                                                 | 239                                                                               | 788                                                                               | 0                                                                                 | 27                                                                                  | 837                                                                                 | 51                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 247                                                                               | 55                                                                                | 214                                                                               | 210                                                                               | 235                                                                               | 15                                                                                | 360                                                                               | 1115                                                                              | 947                                                                               | 351                                                                                 | 976                                                                                 | 826                                                                                 |
| Arrive On Green              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.09                                                                              | 0.60                                                                              | 0.00                                                                              | 0.02                                                                                | 0.52                                                                                | 0.52                                                                                |
| Sat Flow, veh/h              | 1087                                                                              | 406                                                                               | 1583                                                                              | 1370                                                                              | 1735                                                                              | 108                                                                               | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1577                                                                                |
| Grp Volume(v), veh/h         | 104                                                                               | 0                                                                                 | 11                                                                                | 60                                                                                | 0                                                                                 | 17                                                                                | 239                                                                               | 788                                                                               | 0                                                                                 | 27                                                                                  | 837                                                                                 | 51                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1493                                                                              | 0                                                                                 | 1583                                                                              | 1370                                                                              | 0                                                                                 | 1844                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1577                                                                                |
| Q Serve(g_s), s              | 3.6                                                                               | 0.0                                                                               | 0.4                                                                               | 2.7                                                                               | 0.0                                                                               | 0.5                                                                               | 3.6                                                                               | 19.0                                                                              | 0.0                                                                               | 0.5                                                                                 | 25.0                                                                                | 1.0                                                                                 |
| Cycle Q Clear(g_c), s        | 4.1                                                                               | 0.0                                                                               | 0.4                                                                               | 6.8                                                                               | 0.0                                                                               | 0.5                                                                               | 3.6                                                                               | 19.0                                                                              | 0.0                                                                               | 0.5                                                                                 | 25.0                                                                                | 1.0                                                                                 |
| Prop In Lane                 | 0.79                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 302                                                                               | 0                                                                                 | 214                                                                               | 210                                                                               | 0                                                                                 | 249                                                                               | 360                                                                               | 1115                                                                              | 947                                                                               | 351                                                                                 | 976                                                                                 | 826                                                                                 |
| V/C Ratio(X)                 | 0.34                                                                              | 0.00                                                                              | 0.05                                                                              | 0.29                                                                              | 0.00                                                                              | 0.07                                                                              | 0.66                                                                              | 0.71                                                                              | 0.00                                                                              | 0.08                                                                                | 0.86                                                                                | 0.06                                                                                |
| Avail Cap(c_a), veh/h        | 674                                                                               | 0                                                                                 | 615                                                                               | 557                                                                               | 0                                                                                 | 716                                                                               | 610                                                                               | 1476                                                                              | 1255                                                                              | 733                                                                                 | 1476                                                                                | 1250                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 25.8                                                                              | 0.0                                                                               | 24.2                                                                              | 29.0                                                                              | 0.0                                                                               | 24.3                                                                              | 13.0                                                                              | 9.0                                                                               | 0.0                                                                               | 8.5                                                                                 | 13.2                                                                                | 7.5                                                                                 |
| Incr Delay (d2), s/veh       | 0.7                                                                               | 0.0                                                                               | 0.1                                                                               | 0.7                                                                               | 0.0                                                                               | 0.1                                                                               | 2.1                                                                               | 1.0                                                                               | 0.0                                                                               | 0.1                                                                                 | 3.4                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.8                                                                               | 0.0                                                                               | 0.2                                                                               | 1.1                                                                               | 0.0                                                                               | 0.3                                                                               | 2.5                                                                               | 10.0                                                                              | 0.0                                                                               | 0.2                                                                                 | 13.5                                                                                | 0.4                                                                                 |
| LnGrp Delay(d),s/veh         | 26.5                                                                              | 0.0                                                                               | 24.3                                                                              | 29.7                                                                              | 0.0                                                                               | 24.4                                                                              | 15.1                                                                              | 10.0                                                                              | 0.0                                                                               | 8.6                                                                                 | 16.6                                                                                | 7.6                                                                                 |
| LnGrp LOS                    | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                 |                                                                                   | C                                                                                 | B                                                                                 | B                                                                                 |                                                                                   | A                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 115                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 77                                                                                |                                                                                   | 1027                                                                              |                                                                                   | 915                                                                                 |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 26.3                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 28.6                                                                              |                                                                                   | 11.2                                                                              |                                                                                   | 15.9                                                                                |                                                                                     |                                                                                     |
| Approach LOS                 | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   | C                                                                                 |                                                                                   | B                                                                                 |                                                                                   | B                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 4                                                                                 |                                                                                   | 5                                                                                 | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 6.1                                                                               | 44.5                                                                              | 13.7                                                                              |                                                                                   | 10.9                                                                              | 39.7                                                                              | 13.7                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 6.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 51.0                                                                              | 25.0                                                                              |                                                                                   | 15.0                                                                              | 51.0                                                                              | 25.0                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+12, s) | 12.5                                                                              | 21.0                                                                              | 6.1                                                                               |                                                                                   | 5.6                                                                               | 27.0                                                                              | 8.8                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 6.3                                                                               | 0.5                                                                               |                                                                                   | 0.5                                                                               | 6.7                                                                               | 0.2                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          | 14.7                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 3: Honoapiilani Highway & Akahele Street

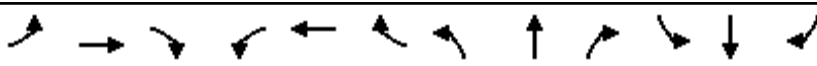
10/05/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |  |   |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)        | 60                                                                                | 50                                                                                | 100                                                                               | 145                                                                               | 50                                                                                | 90                                                                                | 170                                                                               | 915                                                                               | 155                                                                               | 135                                                                                 | 865                                                                                 | 75                                                                                  |
| Future Volume (veh/h)         | 60                                                                                | 50                                                                                | 100                                                                               | 145                                                                               | 50                                                                                | 90                                                                                | 170                                                                               | 915                                                                               | 155                                                                               | 135                                                                                 | 865                                                                                 | 75                                                                                  |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                 | 2                                                                                 | 12                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                              |                                                                                   | 0.96                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 65                                                                                | 54                                                                                | 62                                                                                | 158                                                                               | 54                                                                                | 9                                                                                 | 185                                                                               | 995                                                                               | 131                                                                               | 147                                                                                 | 940                                                                                 | 42                                                                                  |
| Adj No. of Lanes              | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 84                                                                                | 73                                                                                | 84                                                                                | 185                                                                               | 282                                                                               | 237                                                                               | 209                                                                               | 1049                                                                              | 892                                                                               | 170                                                                                 | 1008                                                                                | 855                                                                                 |
| Arrive On Green               | 0.05                                                                              | 0.09                                                                              | 0.09                                                                              | 0.10                                                                              | 0.15                                                                              | 0.15                                                                              | 0.12                                                                              | 0.56                                                                              | 0.56                                                                              | 0.10                                                                                | 0.54                                                                                | 0.54                                                                                |
| Sat Flow, veh/h               | 1774                                                                              | 775                                                                               | 890                                                                               | 1774                                                                              | 1863                                                                              | 1561                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1580                                                                                |
| Grp Volume(v), veh/h          | 65                                                                                | 0                                                                                 | 116                                                                               | 158                                                                               | 54                                                                                | 9                                                                                 | 185                                                                               | 995                                                                               | 131                                                                               | 147                                                                                 | 940                                                                                 | 42                                                                                  |
| Grp Sat Flow(s),veh/h/ln      | 1774                                                                              | 0                                                                                 | 1665                                                                              | 1774                                                                              | 1863                                                                              | 1561                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1580                                                                                |
| Q Serve(g_s), s               | 5.1                                                                               | 0.0                                                                               | 9.5                                                                               | 12.3                                                                              | 3.6                                                                               | 0.7                                                                               | 14.4                                                                              | 70.4                                                                              | 5.5                                                                               | 11.5                                                                                | 65.7                                                                                | 1.8                                                                                 |
| Cycle Q Clear(g_c), s         | 5.1                                                                               | 0.0                                                                               | 9.5                                                                               | 12.3                                                                              | 3.6                                                                               | 0.7                                                                               | 14.4                                                                              | 70.4                                                                              | 5.5                                                                               | 11.5                                                                                | 65.7                                                                                | 1.8                                                                                 |
| Prop In Lane                  | 1.00                                                                              |                                                                                   | 0.53                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 84                                                                                | 0                                                                                 | 158                                                                               | 185                                                                               | 282                                                                               | 237                                                                               | 209                                                                               | 1049                                                                              | 892                                                                               | 170                                                                                 | 1008                                                                                | 855                                                                                 |
| V/C Ratio(X)                  | 0.77                                                                              | 0.00                                                                              | 0.74                                                                              | 0.85                                                                              | 0.19                                                                              | 0.04                                                                              | 0.89                                                                              | 0.95                                                                              | 0.15                                                                              | 0.87                                                                                | 0.93                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h         | 404                                                                               | 0                                                                                 | 213                                                                               | 404                                                                               | 282                                                                               | 237                                                                               | 240                                                                               | 1139                                                                              | 968                                                                               | 177                                                                                 | 1073                                                                                | 910                                                                                 |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 66.2                                                                              | 0.0                                                                               | 61.9                                                                              | 61.9                                                                              | 52.1                                                                              | 50.9                                                                              | 61.1                                                                              | 28.8                                                                              | 14.6                                                                              | 62.7                                                                                | 29.9                                                                                | 15.2                                                                                |
| Incr Delay (d2), s/veh        | 13.9                                                                              | 0.0                                                                               | 8.5                                                                               | 10.6                                                                              | 0.3                                                                               | 0.1                                                                               | 27.9                                                                              | 15.3                                                                              | 0.1                                                                               | 32.6                                                                                | 13.7                                                                                | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 2.8                                                                               | 0.0                                                                               | 4.8                                                                               | 6.6                                                                               | 1.9                                                                               | 0.3                                                                               | 8.7                                                                               | 40.4                                                                              | 2.4                                                                               | 7.2                                                                                 | 37.5                                                                                | 0.8                                                                                 |
| LnGrp Delay(d),s/veh          | 80.1                                                                              | 0.0                                                                               | 70.4                                                                              | 72.5                                                                              | 52.5                                                                              | 51.0                                                                              | 89.0                                                                              | 44.1                                                                              | 14.7                                                                              | 95.3                                                                                | 43.6                                                                                | 15.2                                                                                |
| LnGrp LOS                     | F                                                                                 |                                                                                   | E                                                                                 | E                                                                                 | D                                                                                 | D                                                                                 | F                                                                                 | D                                                                                 | B                                                                                 | F                                                                                   | D                                                                                   | B                                                                                   |
| Approach Vol, veh/h           | 181                                                                               |                                                                                   |                                                                                   |                                                                                   | 221                                                                               |                                                                                   |                                                                                   |                                                                                   | 1311                                                                              |                                                                                     | 1129                                                                                |                                                                                     |
| Approach Delay, s/veh         | 73.9                                                                              |                                                                                   |                                                                                   |                                                                                   | 66.8                                                                              |                                                                                   |                                                                                   |                                                                                   | 47.5                                                                              |                                                                                     | 49.2                                                                                |                                                                                     |
| Approach LOS                  | E                                                                                 |                                                                                   |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                     | D                                                                                   |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 18.5                                                                              | 84.2                                                                              | 19.7                                                                              | 18.3                                                                              | 21.5                                                                              | 81.1                                                                              | 11.7                                                                              | 26.3                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 14.0                                                                              | 86.0                                                                              | 32.0                                                                              | 18.0                                                                              | 19.0                                                                              | 81.0                                                                              | 32.0                                                                              | 18.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.0), s | 11.5                                                                              | 72.4                                                                              | 14.3                                                                              | 11.5                                                                              | 16.4                                                                              | 67.7                                                                              | 7.1                                                                               | 5.6                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.0                                                                               | 6.8                                                                               | 0.4                                                                               | 0.3                                                                               | 0.1                                                                               | 6.0                                                                               | 0.1                                                                               | 0.2                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           |                                                                                   |                                                                                   | 51.4                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 4: Honoapiilani Highway & Lower Honoapiilani Road

10/05/2017

|                             |                                                                                    |                                                                                   |                                                                                   |      |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
|-----------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                             |  |                                                                                   |                                                                                   |      |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Movement                    | EBL                                                                                | EBT                                                                               | EBR                                                                               | WBL  | WBT                                                                               | WBR   | NBL                                                                               | NBT                                                                               | NBR  | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations         |                                                                                    |  |  |      |  |       |  |  |      |  |  |  |
| Traffic Volume (veh/h)      | 95                                                                                 | 5                                                                                 | 600                                                                               | 80   | 10                                                                                | 10    | 605                                                                               | 1135                                                                              | 10   | 5                                                                                   | 1055                                                                                | 25                                                                                  |
| Future Volume (veh/h)       | 95                                                                                 | 5                                                                                 | 600                                                                               | 80   | 10                                                                                | 10    | 605                                                                               | 1135                                                                              | 10   | 5                                                                                   | 1055                                                                                | 25                                                                                  |
| Number                      | 3                                                                                  | 8                                                                                 | 18                                                                                | 7    | 4                                                                                 | 14    | 1                                                                                 | 6                                                                                 | 16   | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh         | 0                                                                                  | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0     | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)         | 1.00                                                                               |                                                                                   | 1.00                                                                              | 1.00 |                                                                                   | 1.00  | 1.00                                                                              |                                                                                   | 1.00 | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj            | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00  | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln      | 1900                                                                               | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                              | 1900  | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h        | 103                                                                                | 5                                                                                 | 0                                                                                 | 87   | 11                                                                                | 9     | 658                                                                               | 1234                                                                              | 11   | 5                                                                                   | 1147                                                                                | 6                                                                                   |
| Adj No. of Lanes            | 0                                                                                  | 1                                                                                 | 1                                                                                 | 0    | 1                                                                                 | 0     | 1                                                                                 | 2                                                                                 | 0    | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor            | 0.92                                                                               | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92  | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %        | 2                                                                                  | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2     | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                  | 184                                                                                | 6                                                                                 | 137                                                                               | 173  | 15                                                                                | 12    | 692                                                                               | 2820                                                                              | 25   | 7                                                                                   | 1410                                                                                | 631                                                                                 |
| Arrive On Green             | 0.09                                                                               | 0.09                                                                              | 0.00                                                                              | 0.09 | 0.09                                                                              | 0.09  | 0.39                                                                              | 0.78                                                                              | 0.78 | 0.00                                                                                | 0.40                                                                                | 0.40                                                                                |
| Sat Flow, veh/h             | 1443                                                                               | 70                                                                                | 1583                                                                              | 1374 | 174                                                                               | 142   | 1774                                                                              | 3595                                                                              | 32   | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h        | 108                                                                                | 0                                                                                 | 0                                                                                 | 107  | 0                                                                                 | 0     | 658                                                                               | 607                                                                               | 638  | 5                                                                                   | 1147                                                                                | 6                                                                                   |
| Grp Sat Flow(s),veh/h/ln    | 1513                                                                               | 0                                                                                 | 1583                                                                              | 1690 | 0                                                                                 | 0     | 1774                                                                              | 1770                                                                              | 1857 | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s             | 1.2                                                                                | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0   | 43.2                                                                              | 13.5                                                                              | 13.5 | 0.3                                                                                 | 34.6                                                                                | 0.3                                                                                 |
| Cycle Q Clear(g_c), s       | 8.1                                                                                | 0.0                                                                               | 0.0                                                                               | 6.9  | 0.0                                                                               | 0.0   | 43.2                                                                              | 13.5                                                                              | 13.5 | 0.3                                                                                 | 34.6                                                                                | 0.3                                                                                 |
| Prop In Lane                | 0.95                                                                               |                                                                                   | 1.00                                                                              | 0.81 |                                                                                   | 0.08  | 1.00                                                                              |                                                                                   | 0.02 | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h      | 202                                                                                | 0                                                                                 | 137                                                                               | 215  | 0                                                                                 | 0     | 692                                                                               | 1388                                                                              | 1457 | 7                                                                                   | 1410                                                                                | 631                                                                                 |
| V/C Ratio(X)                | 0.53                                                                               | 0.00                                                                              | 0.00                                                                              | 0.50 | 0.00                                                                              | 0.00  | 0.95                                                                              | 0.44                                                                              | 0.44 | 0.73                                                                                | 0.81                                                                                | 0.01                                                                                |
| Avail Cap(c_a), veh/h       | 431                                                                                | 0                                                                                 | 396                                                                               | 416  | 0                                                                                 | 0     | 1049                                                                              | 1388                                                                              | 1457 | 1049                                                                                | 1680                                                                                | 752                                                                                 |
| HCM Platoon Ratio           | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00  | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)          | 1.00                                                                               | 0.00                                                                              | 0.00                                                                              | 1.00 | 0.00                                                                              | 0.00  | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh    | 53.3                                                                               | 0.0                                                                               | 0.0                                                                               | 52.9 | 0.0                                                                               | 0.0   | 35.5                                                                              | 4.2                                                                               | 4.2  | 59.8                                                                                | 32.2                                                                                | 21.8                                                                                |
| Incr Delay (d2), s/veh      | 2.2                                                                                | 0.0                                                                               | 0.0                                                                               | 1.8  | 0.0                                                                               | 0.0   | 10.6                                                                              | 0.5                                                                               | 0.4  | 43.1                                                                                | 3.5                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh   | 0.0                                                                                | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0   | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln    | 8.6                                                                                | 0.0                                                                               | 0.0                                                                               | 3.5  | 0.0                                                                               | 0.0   | 23.1                                                                              | 6.6                                                                               | 6.9  | 0.2                                                                                 | 17.6                                                                                | 0.1                                                                                 |
| LnGrp Delay(d),s/veh        | 55.4                                                                               | 0.0                                                                               | 0.0                                                                               | 54.6 | 0.0                                                                               | 0.0   | 46.1                                                                              | 4.7                                                                               | 4.7  | 102.9                                                                               | 35.7                                                                                | 21.8                                                                                |
| LnGrp LOS                   | E                                                                                  |                                                                                   |                                                                                   | D    |                                                                                   |       | D                                                                                 | A                                                                                 | A    | F                                                                                   | D                                                                                   | C                                                                                   |
| Approach Vol, veh/h         | 108                                                                                |                                                                                   |                                                                                   | 107  |                                                                                   |       | 1903                                                                              |                                                                                   |      | 1158                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh       | 55.4                                                                               |                                                                                   |                                                                                   | 54.6 |                                                                                   |       | 19.0                                                                              |                                                                                   |      | 35.9                                                                                |                                                                                     |                                                                                     |
| Approach LOS                | E                                                                                  |                                                                                   |                                                                                   | D    |                                                                                   |       | B                                                                                 |                                                                                   |      | D                                                                                   |                                                                                     |                                                                                     |
| Timer                       | 1                                                                                  | 2                                                                                 | 3                                                                                 | 4    | 5                                                                                 | 6     | 7                                                                                 | 8                                                                                 |      |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                | 1                                                                                  | 2                                                                                 |                                                                                   | 4    | 5                                                                                 | 6     |                                                                                   | 8                                                                                 |      |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s    | 50.9                                                                               | 53.8                                                                              |                                                                                   | 15.4 | 4.5                                                                               | 100.2 |                                                                                   | 15.4                                                                              |      |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s     | 4.0                                                                                | 6.0                                                                               |                                                                                   | 5.0  | 4.0                                                                               | 6.0   |                                                                                   | 5.0                                                                               |      |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s | 71.0                                                                               | 57.0                                                                              |                                                                                   | 27.0 | 71.0                                                                              | 57.0  |                                                                                   | 30.0                                                                              |      |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+M), s | 45.2                                                                               | 36.6                                                                              |                                                                                   | 8.9  | 2.3                                                                               | 15.5  |                                                                                   | 10.1                                                                              |      |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s     | 1.7                                                                                | 11.2                                                                              |                                                                                   | 0.3  | 0.0                                                                               | 16.8  |                                                                                   | 0.3                                                                               |      |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary        |                                                                                    |                                                                                   |                                                                                   |      |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay         | 27.4                                                                               |                                                                                   |                                                                                   |      |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                | C                                                                                  |                                                                                   |                                                                                   |      |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Notes                       |                                                                                    |                                                                                   |                                                                                   |      |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 5: Honoapiilani Highway & Halawai Drive

10/05/2017

|                              |                                                                                    |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
|------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                              |  |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Movement                     | EBL                                                                                | EBT                                                                               | EBR                                                                               | WBL  | WBT                                                                               | WBR  | NBL                                                                               | NBT                                                                               | NBR  | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                    |  |  |      |  |      |  |  |      |  |  |  |
| Traffic Volume (veh/h)       | 55                                                                                 | 5                                                                                 | 140                                                                               | 15   | 0                                                                                 | 5    | 135                                                                               | 1685                                                                              | 10   | 10                                                                                  | 1745                                                                                | 60                                                                                  |
| Future Volume (veh/h)        | 55                                                                                 | 5                                                                                 | 140                                                                               | 15   | 0                                                                                 | 5    | 135                                                                               | 1685                                                                              | 10   | 10                                                                                  | 1745                                                                                | 60                                                                                  |
| Number                       | 3                                                                                  | 8                                                                                 | 18                                                                                | 7    | 4                                                                                 | 14   | 1                                                                                 | 6                                                                                 | 16   | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                  | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.97                                                                               |                                                                                   | 0.96                                                                              | 0.97 |                                                                                   | 0.96 | 1.00                                                                              |                                                                                   | 1.00 | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                               | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 60                                                                                 | 5                                                                                 | 5                                                                                 | 16   | 0                                                                                 | 1    | 147                                                                               | 1832                                                                              | 11   | 11                                                                                  | 1897                                                                                | 41                                                                                  |
| Adj No. of Lanes             | 0                                                                                  | 1                                                                                 | 1                                                                                 | 0    | 1                                                                                 | 0    | 1                                                                                 | 2                                                                                 | 0    | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                               | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                  | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 220                                                                                | 16                                                                                | 171                                                                               | 170  | 2                                                                                 | 7    | 177                                                                               | 2697                                                                              | 16   | 14                                                                                  | 2322                                                                                | 1038                                                                                |
| Arrive On Green              | 0.12                                                                               | 0.11                                                                              | 0.11                                                                              | 0.12 | 0.00                                                                              | 0.11 | 0.10                                                                              | 0.75                                                                              | 0.75 | 0.01                                                                                | 0.66                                                                                | 0.66                                                                                |
| Sat Flow, veh/h              | 1380                                                                               | 139                                                                               | 1520                                                                              | 923  | 17                                                                                | 59   | 1774                                                                              | 3607                                                                              | 22   | 1774                                                                                | 3539                                                                                | 1582                                                                                |
| Grp Volume(v), veh/h         | 65                                                                                 | 0                                                                                 | 5                                                                                 | 17   | 0                                                                                 | 0    | 147                                                                               | 898                                                                               | 945  | 11                                                                                  | 1897                                                                                | 41                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1519                                                                               | 0                                                                                 | 1520                                                                              | 999  | 0                                                                                 | 0    | 1774                                                                              | 1770                                                                              | 1859 | 1774                                                                                | 1770                                                                                | 1582                                                                                |
| Q Serve(g_s), s              | 0.0                                                                                | 0.0                                                                               | 0.3                                                                               | 1.1  | 0.0                                                                               | 0.0  | 8.6                                                                               | 27.6                                                                              | 27.7 | 0.7                                                                                 | 42.1                                                                                | 1.0                                                                                 |
| Cycle Q Clear(g_c), s        | 3.6                                                                                | 0.0                                                                               | 0.3                                                                               | 4.7  | 0.0                                                                               | 0.0  | 8.6                                                                               | 27.6                                                                              | 27.7 | 0.7                                                                                 | 42.1                                                                                | 1.0                                                                                 |
| Prop In Lane                 | 0.92                                                                               |                                                                                   | 1.00                                                                              | 0.94 |                                                                                   | 0.06 | 1.00                                                                              |                                                                                   | 0.01 | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 250                                                                                | 0                                                                                 | 171                                                                               | 188  | 0                                                                                 | 0    | 177                                                                               | 1323                                                                              | 1390 | 14                                                                                  | 2322                                                                                | 1038                                                                                |
| V/C Ratio(X)                 | 0.26                                                                               | 0.00                                                                              | 0.03                                                                              | 0.09 | 0.00                                                                              | 0.00 | 0.83                                                                              | 0.68                                                                              | 0.68 | 0.79                                                                                | 0.82                                                                                | 0.04                                                                                |
| Avail Cap(c_a), veh/h        | 396                                                                                | 0                                                                                 | 330                                                                               | 330  | 0                                                                                 | 0    | 351                                                                               | 1435                                                                              | 1507 | 184                                                                                 | 2536                                                                                | 1134                                                                                |
| HCM Platoon Ratio            | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                               | 0.00                                                                              | 1.00                                                                              | 1.00 | 0.00                                                                              | 0.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 43.0                                                                               | 0.0                                                                               | 41.9                                                                              | 44.6 | 0.0                                                                               | 0.0  | 46.9                                                                              | 6.8                                                                               | 6.9  | 52.5                                                                                | 13.5                                                                                | 6.4                                                                                 |
| Incr Delay (d2), s/veh       | 0.2                                                                                | 0.0                                                                               | 0.0                                                                               | 0.1  | 0.0                                                                               | 0.0  | 3.8                                                                               | 1.7                                                                               | 1.6  | 29.9                                                                                | 2.5                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                                | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.7                                                                                | 0.0                                                                               | 0.1                                                                               | 0.5  | 0.0                                                                               | 0.0  | 4.4                                                                               | 13.8                                                                              | 14.5 | 0.4                                                                                 | 21.1                                                                                | 0.4                                                                                 |
| LnGrp Delay(d),s/veh         | 43.2                                                                               | 0.0                                                                               | 41.9                                                                              | 44.6 | 0.0                                                                               | 0.0  | 50.7                                                                              | 8.5                                                                               | 8.5  | 82.4                                                                                | 16.0                                                                                | 6.5                                                                                 |
| LnGrp LOS                    | D                                                                                  |                                                                                   | D                                                                                 | D    |                                                                                   |      | D                                                                                 | A                                                                                 | A    | F                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 70                                                                                 |                                                                                   |                                                                                   |      |                                                                                   | 17   |                                                                                   | 1990                                                                              |      | 1949                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 43.1                                                                               |                                                                                   |                                                                                   |      |                                                                                   | 44.6 |                                                                                   | 11.6                                                                              |      | 16.2                                                                                |                                                                                     |                                                                                     |
| Approach LOS                 | D                                                                                  |                                                                                   |                                                                                   |      |                                                                                   | D    |                                                                                   | B                                                                                 |      | B                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                  | 2                                                                                 | 3                                                                                 | 4    | 5                                                                                 | 6    | 7                                                                                 | 8                                                                                 |      |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                  | 2                                                                                 | 4                                                                                 |      | 5                                                                                 | 6    | 8                                                                                 |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 14.6                                                                               | 74.6                                                                              | 16.9                                                                              |      | 4.8                                                                               | 84.3 | 16.9                                                                              |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                                | 5.0                                                                               | 5.0                                                                               |      | 4.0                                                                               | 5.0  | 5.0                                                                               |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 21.0                                                                               | 76.0                                                                              | 23.0                                                                              |      | 11.0                                                                              | 86.0 | 23.0                                                                              |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+10), s | 10.6                                                                               | 44.1                                                                              | 6.7                                                                               |      | 2.7                                                                               | 29.7 | 5.6                                                                               |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.1                                                                                | 25.4                                                                              | 0.0                                                                               |      | 0.0                                                                               | 36.9 | 0.1                                                                               |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                    |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                    |                                                                                   | 14.5                                                                              |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                    |                                                                                   | B                                                                                 |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 6: Honoapiilani Highway & Kai Ala Drive/Puukolii Road

10/05/2017

|                                |                                                                                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|--------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Movement                       | EBL                                                                                | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR   | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations            |                                                                                    |  |  |  |  |       |  |  |  |  |  |  |
| Traffic Volume (veh/h)         | 85                                                                                 | 5                                                                                 | 175                                                                               | 70                                                                                | 5                                                                                 | 50    | 125                                                                               | 1690                                                                              | 60                                                                                | 35                                                                                  | 1890                                                                                | 105                                                                                 |
| Future Volume (veh/h)          | 85                                                                                 | 5                                                                                 | 175                                                                               | 70                                                                                | 5                                                                                 | 50    | 125                                                                               | 1690                                                                              | 60                                                                                | 35                                                                                  | 1890                                                                                | 105                                                                                 |
| Number                         | 3                                                                                  | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14    | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh            | 0                                                                                  | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0     | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)            | 0.99                                                                               |                                                                                   | 0.99                                                                              | 0.99                                                                              |                                                                                   | 0.99  | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj               | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00  | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln         | 1900                                                                               | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900  | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h           | 92                                                                                 | 5                                                                                 | 44                                                                                | 76                                                                                | 5                                                                                 | 2     | 136                                                                               | 1837                                                                              | 48                                                                                | 38                                                                                  | 2054                                                                                | 92                                                                                  |
| Adj No. of Lanes               | 0                                                                                  | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0     | 1                                                                                 | 2                                                                                 | 1                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor               | 0.92                                                                               | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92  | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %           | 2                                                                                  | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2     | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                     | 222                                                                                | 10                                                                                | 216                                                                               | 138                                                                               | 174                                                                               | 70    | 157                                                                               | 2632                                                                              | 1177                                                                              | 49                                                                                  | 2415                                                                                | 1081                                                                                |
| Arrive On Green                | 0.14                                                                               | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14  | 0.09                                                                              | 0.74                                                                              | 0.74                                                                              | 0.03                                                                                | 0.68                                                                                | 0.68                                                                                |
| Sat Flow, veh/h                | 1300                                                                               | 71                                                                                | 1563                                                                              | 1338                                                                              | 1261                                                                              | 505   | 1774                                                                              | 3539                                                                              | 1582                                                                              | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h           | 97                                                                                 | 0                                                                                 | 44                                                                                | 76                                                                                | 0                                                                                 | 7     | 136                                                                               | 1837                                                                              | 48                                                                                | 38                                                                                  | 2054                                                                                | 92                                                                                  |
| Grp Sat Flow(s),veh/h/ln       | 1371                                                                               | 0                                                                                 | 1563                                                                              | 1338                                                                              | 0                                                                                 | 1766  | 1774                                                                              | 1770                                                                              | 1582                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s                | 10.5                                                                               | 0.0                                                                               | 4.1                                                                               | 9.2                                                                               | 0.0                                                                               | 0.6   | 12.5                                                                              | 45.7                                                                              | 1.3                                                                               | 3.5                                                                                 | 72.5                                                                                | 3.2                                                                                 |
| Cycle Q Clear(g_c), s          | 11.1                                                                               | 0.0                                                                               | 4.1                                                                               | 20.3                                                                              | 0.0                                                                               | 0.6   | 12.5                                                                              | 45.7                                                                              | 1.3                                                                               | 3.5                                                                                 | 72.5                                                                                | 3.2                                                                                 |
| Prop In Lane                   | 0.95                                                                               |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.29  | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h         | 240                                                                                | 0                                                                                 | 216                                                                               | 138                                                                               | 0                                                                                 | 244   | 157                                                                               | 2632                                                                              | 1177                                                                              | 49                                                                                  | 2415                                                                                | 1081                                                                                |
| V/C Ratio(X)                   | 0.40                                                                               | 0.00                                                                              | 0.20                                                                              | 0.55                                                                              | 0.00                                                                              | 0.03  | 0.86                                                                              | 0.70                                                                              | 0.04                                                                              | 0.78                                                                                | 0.85                                                                                | 0.09                                                                                |
| Avail Cap(c_a), veh/h          | 250                                                                                | 0                                                                                 | 227                                                                               | 148                                                                               | 0                                                                                 | 257   | 280                                                                               | 2632                                                                              | 1177                                                                              | 108                                                                                 | 2415                                                                                | 1081                                                                                |
| HCM Platoon Ratio              | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00  | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)             | 1.00                                                                               | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00  | 0.60                                                                              | 0.60                                                                              | 0.60                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh       | 65.9                                                                               | 0.0                                                                               | 63.1                                                                              | 75.5                                                                              | 0.0                                                                               | 61.6  | 74.2                                                                              | 11.3                                                                              | 5.6                                                                               | 79.7                                                                                | 19.8                                                                                | 8.8                                                                                 |
| Incr Delay (d2), s/veh         | 1.1                                                                                | 0.0                                                                               | 0.5                                                                               | 3.7                                                                               | 0.0                                                                               | 0.0   | 3.3                                                                               | 0.9                                                                               | 0.0                                                                               | 9.3                                                                                 | 4.0                                                                                 | 0.2                                                                                 |
| Initial Q Delay(d3),s/veh      | 0.0                                                                                | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0   | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln       | 4.1                                                                                | 0.0                                                                               | 1.8                                                                               | 3.6                                                                               | 0.0                                                                               | 0.3   | 6.3                                                                               | 22.5                                                                              | 0.6                                                                               | 1.8                                                                                 | 36.4                                                                                | 1.5                                                                                 |
| LnGrp Delay(d),s/veh           | 67.0                                                                               | 0.0                                                                               | 63.6                                                                              | 79.2                                                                              | 0.0                                                                               | 61.6  | 77.5                                                                              | 12.2                                                                              | 5.6                                                                               | 89.0                                                                                | 23.8                                                                                | 9.0                                                                                 |
| LnGrp LOS                      | E                                                                                  |                                                                                   | E                                                                                 | E                                                                                 |                                                                                   | E     | E                                                                                 | B                                                                                 | A                                                                                 | F                                                                                   | C                                                                                   | A                                                                                   |
| Approach Vol, veh/h            | 141                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 83    |                                                                                   | 2021                                                                              |                                                                                   | 2184                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh          | 65.9                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 77.7  |                                                                                   | 16.5                                                                              |                                                                                   | 24.3                                                                                |                                                                                     |                                                                                     |
| Approach LOS                   | E                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   | E     |                                                                                   | B                                                                                 |                                                                                   | C                                                                                   |                                                                                     |                                                                                     |
| Timer                          | 1                                                                                  | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6     | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                   | 1                                                                                  | 2                                                                                 | 4                                                                                 |                                                                                   | 5                                                                                 | 6     | 8                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s       | 18.6                                                                               | 118.6                                                                             | 27.8                                                                              |                                                                                   | 8.6                                                                               | 128.7 | 27.8                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s        | 4.0                                                                                | 6.0                                                                               | 5.0                                                                               |                                                                                   | 4.0                                                                               | 6.0   | 5.0                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s    | 20.0                                                                               | 100.0                                                                             | 24.0                                                                              |                                                                                   | 10.0                                                                              | 116.0 | 24.0                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+14.5), s | 14.5                                                                               | 74.5                                                                              | 22.3                                                                              |                                                                                   | 5.5                                                                               | 47.7  | 13.1                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s        | 0.2                                                                                | 22.5                                                                              | 0.0                                                                               |                                                                                   | 0.0                                                                               | 42.6  | 0.3                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary           |                                                                                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay            |                                                                                    |                                                                                   | 23.1                                                                              |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                   |                                                                                    |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 7: Honoapiilani Highway & Kaanapali Parkway/Halelo Street

10/05/2017

|                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-----------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                             |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                    | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations         |  |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)      | 390                                                                               | 5                                                                                 | 740                                                                               | 15                                                                                | 0                                                                                 | 5                                                                                 | 500                                                                               | 1650                                                                              | 10                                                                                | 80                                                                                  | 1845                                                                                | 200                                                                                 |
| Future Volume (veh/h)       | 390                                                                               | 5                                                                                 | 740                                                                               | 15                                                                                | 0                                                                                 | 5                                                                                 | 500                                                                               | 1650                                                                              | 10                                                                                | 80                                                                                  | 1845                                                                                | 200                                                                                 |
| Number                      | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh         | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)         | 1.00                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                              |                                                                                   | 0.94                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln      | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h        | 428                                                                               | 0                                                                                 | 662                                                                               | 16                                                                                | 0                                                                                 | 1                                                                                 | 543                                                                               | 1793                                                                              | 11                                                                                | 87                                                                                  | 2005                                                                                | 185                                                                                 |
| Adj No. of Lanes            | 2                                                                                 | 0                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 2                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor            | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %        | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                  | 472                                                                               | 0                                                                                 | 946                                                                               | 40                                                                                | 0                                                                                 | 3                                                                                 | 590                                                                               | 2597                                                                              | 16                                                                                | 112                                                                                 | 2166                                                                                | 1174                                                                                |
| Arrive On Green             | 0.13                                                                              | 0.00                                                                              | 0.13                                                                              | 0.02                                                                              | 0.00                                                                              | 0.01                                                                              | 0.17                                                                              | 0.72                                                                              | 0.71                                                                              | 0.06                                                                                | 0.61                                                                                | 0.61                                                                                |
| Sat Flow, veh/h             | 3548                                                                              | 0                                                                                 | 3118                                                                              | 1650                                                                              | 0                                                                                 | 103                                                                               | 3442                                                                              | 3606                                                                              | 22                                                                                | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h        | 428                                                                               | 0                                                                                 | 662                                                                               | 17                                                                                | 0                                                                                 | 0                                                                                 | 543                                                                               | 879                                                                               | 925                                                                               | 87                                                                                  | 2005                                                                                | 185                                                                                 |
| Grp Sat Flow(s),veh/h/ln    | 1774                                                                              | 0                                                                                 | 1559                                                                              | 1754                                                                              | 0                                                                                 | 0                                                                                 | 1721                                                                              | 1770                                                                              | 1859                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s             | 32.2                                                                              | 0.0                                                                               | 35.0                                                                              | 2.6                                                                               | 0.0                                                                               | 0.0                                                                               | 42.0                                                                              | 74.8                                                                              | 75.1                                                                              | 13.1                                                                                | 137.2                                                                               | 9.3                                                                                 |
| Cycle Q Clear(g_c), s       | 32.2                                                                              | 0.0                                                                               | 35.0                                                                              | 2.6                                                                               | 0.0                                                                               | 0.0                                                                               | 42.0                                                                              | 74.8                                                                              | 75.1                                                                              | 13.1                                                                                | 137.2                                                                               | 9.3                                                                                 |
| Prop In Lane                | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.94                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                              |                                                                                   | 0.01                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h      | 472                                                                               | 0                                                                                 | 946                                                                               | 43                                                                                | 0                                                                                 | 0                                                                                 | 590                                                                               | 1274                                                                              | 1338                                                                              | 112                                                                                 | 2166                                                                                | 1174                                                                                |
| V/C Ratio(X)                | 0.91                                                                              | 0.00                                                                              | 0.70                                                                              | 0.40                                                                              | 0.00                                                                              | 0.00                                                                              | 0.92                                                                              | 0.69                                                                              | 0.69                                                                              | 0.77                                                                                | 0.93                                                                                | 0.16                                                                                |
| Avail Cap(c_a), veh/h       | 472                                                                               | 0                                                                                 | 946                                                                               | 162                                                                               | 0                                                                                 | 0                                                                                 | 610                                                                               | 1281                                                                              | 1346                                                                              | 177                                                                                 | 2288                                                                                | 1228                                                                                |
| HCM Platoon Ratio           | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)          | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh    | 115.7                                                                             | 0.0                                                                               | 84.0                                                                              | 130.2                                                                             | 0.0                                                                               | 0.0                                                                               | 110.3                                                                             | 21.1                                                                              | 21.1                                                                              | 124.9                                                                               | 47.0                                                                                | 10.3                                                                                |
| Incr Delay (d2), s/veh      | 20.7                                                                              | 0.0                                                                               | 2.0                                                                               | 2.2                                                                               | 0.0                                                                               | 0.0                                                                               | 18.5                                                                              | 1.8                                                                               | 1.7                                                                               | 4.2                                                                                 | 7.1                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh   | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln    | 17.2                                                                              | 0.0                                                                               | 22.3                                                                              | 1.3                                                                               | 0.0                                                                               | 0.0                                                                               | 21.6                                                                              | 37.0                                                                              | 38.9                                                                              | 6.6                                                                                 | 69.2                                                                                | 6.1                                                                                 |
| LnGrp Delay(d),s/veh        | 136.4                                                                             | 0.0                                                                               | 85.9                                                                              | 132.4                                                                             | 0.0                                                                               | 0.0                                                                               | 128.9                                                                             | 22.8                                                                              | 22.8                                                                              | 129.1                                                                               | 54.1                                                                                | 10.3                                                                                |
| LnGrp LOS                   | F                                                                                 |                                                                                   | F                                                                                 | F                                                                                 |                                                                                   |                                                                                   | F                                                                                 | C                                                                                 | C                                                                                 | F                                                                                   | D                                                                                   | B                                                                                   |
| Approach Vol, veh/h         | 1090                                                                              |                                                                                   |                                                                                   | 17                                                                                |                                                                                   |                                                                                   | 2347                                                                              |                                                                                   |                                                                                   | 2277                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh       | 105.7                                                                             |                                                                                   |                                                                                   | 132.4                                                                             |                                                                                   |                                                                                   | 47.3                                                                              |                                                                                   |                                                                                   | 53.4                                                                                |                                                                                     |                                                                                     |
| Approach LOS                | F                                                                                 |                                                                                   |                                                                                   | F                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                   |                                                                                     |                                                                                     |
| Timer                       | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s    | 50.4                                                                              | 169.7                                                                             |                                                                                   | 10.6                                                                              | 21.2                                                                              | 198.9                                                                             |                                                                                   | 40.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s     | 6.0                                                                               | 6.0                                                                               |                                                                                   | 7.0                                                                               | 6.0                                                                               | 6.0                                                                               |                                                                                   | 7.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s | 46.0                                                                              | 173.0                                                                             |                                                                                   | 22.0                                                                              | 25.0                                                                              | 194.0                                                                             |                                                                                   | 33.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+Y), s | 14.0                                                                              | 139.2                                                                             |                                                                                   | 4.6                                                                               | 15.1                                                                              | 77.1                                                                              |                                                                                   | 37.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s     | 0.4                                                                               | 24.4                                                                              |                                                                                   | 0.0                                                                               | 0.1                                                                               | 29.2                                                                              |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay         | 61.1                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                | E                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 8: Honoapiilani Highway & Leialii Parkway

10/05/2017

|                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                              |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)       | 10                                                                                | 0                                                                                 | 5                                                                                 | 90                                                                                | 5                                                                                 | 65                                                                                | 10                                                                                | 2110                                                                              | 90                                                                                | 90                                                                                  | 2545                                                                                | 5                                                                                   |
| Future Volume (veh/h)        | 10                                                                                | 0                                                                                 | 5                                                                                 | 90                                                                                | 5                                                                                 | 65                                                                                | 10                                                                                | 2110                                                                              | 90                                                                                | 90                                                                                  | 2545                                                                                | 5                                                                                   |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 11                                                                                | 0                                                                                 | 1                                                                                 | 98                                                                                | 5                                                                                 | 3                                                                                 | 11                                                                                | 2293                                                                              | 96                                                                                | 98                                                                                  | 2766                                                                                | 5                                                                                   |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 155                                                                               | 2                                                                                 | 10                                                                                | 176                                                                               | 95                                                                                | 57                                                                                | 22                                                                                | 2638                                                                              | 110                                                                               | 122                                                                                 | 2965                                                                                | 5                                                                                   |
| Arrive On Green              | 0.09                                                                              | 0.00                                                                              | 0.08                                                                              | 0.09                                                                              | 0.09                                                                              | 0.08                                                                              | 0.02                                                                              | 1.00                                                                              | 1.00                                                                              | 0.07                                                                                | 0.82                                                                                | 0.81                                                                                |
| Sat Flow, veh/h              | 1234                                                                              | 24                                                                                | 114                                                                               | 1410                                                                              | 1092                                                                              | 655                                                                               | 1774                                                                              | 3463                                                                              | 144                                                                               | 1774                                                                                | 3625                                                                                | 7                                                                                   |
| Grp Volume(v), veh/h         | 12                                                                                | 0                                                                                 | 0                                                                                 | 98                                                                                | 0                                                                                 | 8                                                                                 | 11                                                                                | 1164                                                                              | 1225                                                                              | 98                                                                                  | 1350                                                                                | 1421                                                                                |
| Grp Sat Flow(s),veh/h/ln     | 1373                                                                              | 0                                                                                 | 0                                                                                 | 1410                                                                              | 0                                                                                 | 1747                                                                              | 1774                                                                              | 1770                                                                              | 1837                                                                              | 1774                                                                                | 1770                                                                                | 1862                                                                                |
| Q Serve(g_s), s              | 0.9                                                                               | 0.0                                                                               | 0.0                                                                               | 8.0                                                                               | 0.0                                                                               | 0.6                                                                               | 0.9                                                                               | 0.0                                                                               | 0.0                                                                               | 7.9                                                                                 | 84.9                                                                                | 85.1                                                                                |
| Cycle Q Clear(g_c), s        | 1.5                                                                               | 0.0                                                                               | 0.0                                                                               | 9.5                                                                               | 0.0                                                                               | 0.6                                                                               | 0.9                                                                               | 0.0                                                                               | 0.0                                                                               | 7.9                                                                                 | 84.9                                                                                | 85.1                                                                                |
| Prop In Lane                 | 0.92                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                              |                                                                                   | 0.38                                                                              | 1.00                                                                              |                                                                                   | 0.08                                                                              | 1.00                                                                                |                                                                                     | 0.00                                                                                |
| Lane Grp Cap(c), veh/h       | 167                                                                               | 0                                                                                 | 0                                                                                 | 176                                                                               | 0                                                                                 | 152                                                                               | 22                                                                                | 1348                                                                              | 1399                                                                              | 122                                                                                 | 1448                                                                                | 1523                                                                                |
| V/C Ratio(X)                 | 0.07                                                                              | 0.00                                                                              | 0.00                                                                              | 0.56                                                                              | 0.00                                                                              | 0.05                                                                              | 0.50                                                                              | 0.86                                                                              | 0.88                                                                              | 0.80                                                                                | 0.93                                                                                | 0.93                                                                                |
| Avail Cap(c_a), veh/h        | 278                                                                               | 0                                                                                 | 0                                                                                 | 287                                                                               | 0                                                                                 | 289                                                                               | 61                                                                                | 1348                                                                              | 1399                                                                              | 184                                                                                 | 1448                                                                                | 1523                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 2.00                                                                              | 2.00                                                                              | 2.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.41                                                                              | 0.41                                                                              | 0.41                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 61.3                                                                              | 0.0                                                                               | 0.0                                                                               | 64.6                                                                              | 0.0                                                                               | 60.9                                                                              | 70.3                                                                              | 0.0                                                                               | 0.0                                                                               | 66.6                                                                                | 10.1                                                                                | 10.1                                                                                |
| Incr Delay (d2), s/veh       | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 2.7                                                                               | 0.0                                                                               | 0.1                                                                               | 2.7                                                                               | 3.3                                                                               | 3.5                                                                               | 8.0                                                                                 | 12.3                                                                                | 11.8                                                                                |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.5                                                                               | 0.0                                                                               | 0.0                                                                               | 4.0                                                                               | 0.0                                                                               | 0.3                                                                               | 0.5                                                                               | 1.2                                                                               | 1.4                                                                               | 4.1                                                                                 | 45.4                                                                                | 47.6                                                                                |
| LnGrp Delay(d),s/veh         | 61.5                                                                              | 0.0                                                                               | 0.0                                                                               | 67.4                                                                              | 0.0                                                                               | 61.0                                                                              | 73.0                                                                              | 3.3                                                                               | 3.5                                                                               | 74.5                                                                                | 22.4                                                                                | 22.0                                                                                |
| LnGrp LOS                    | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                 | A                                                                                 | A                                                                                 | E                                                                                   | C                                                                                   | C                                                                                   |
| Approach Vol, veh/h          | 12                                                                                |                                                                                   |                                                                                   |                                                                                   | 106                                                                               |                                                                                   | 2400                                                                              |                                                                                   |                                                                                   |                                                                                     | 2869                                                                                |                                                                                     |
| Approach Delay, s/veh        | 61.5                                                                              |                                                                                   |                                                                                   |                                                                                   | 66.9                                                                              |                                                                                   | 3.7                                                                               |                                                                                   |                                                                                   |                                                                                     | 24.0                                                                                |                                                                                     |
| Approach LOS                 | E                                                                                 |                                                                                   |                                                                                   |                                                                                   | E                                                                                 |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                     | C                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.8                                                                               | 122.6                                                                             |                                                                                   |                                                                                   | 16.6                                                                              | 14.0                                                                              | 114.4                                                                             | 16.6                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 5.0                                                                               | 103.0                                                                             |                                                                                   |                                                                                   | 23.0                                                                              | 15.0                                                                              | 93.0                                                                              | 23.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+12, s) | 12.5                                                                              | 87.1                                                                              |                                                                                   |                                                                                   | 11.5                                                                              | 9.9                                                                               | 2.0                                                                               | 3.5                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 15.7                                                                              |                                                                                   |                                                                                   | 0.2                                                                               | 0.1                                                                               | 77.2                                                                              | 0.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 15.9                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 9: Honoapiilani Highway & Front Street/Flemming Road

10/05/2017

|                               | <div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div> |                                                                                   |      |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                      | EBL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | EBT                                                                               | EBR  | WBL  | WBT                                                                               | WBR  | NBL                                                                               | NBT                                                                               | NBR  | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |      |      |  |      |  |  |      |  |  |  |
| Traffic Volume (veh/h)        | 195                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 15                                                                                | 10   | 60   | 5                                                                                 | 10   | 5                                                                                 | 2015                                                                              | 20   | 5                                                                                   | 2180                                                                                | 340                                                                                 |
| Future Volume (veh/h)         | 195                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 15                                                                                | 10   | 60   | 5                                                                                 | 10   | 5                                                                                 | 2015                                                                              | 20   | 5                                                                                   | 2180                                                                                | 340                                                                                 |
| Number                        | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 8                                                                                 | 18   | 7    | 4                                                                                 | 14   | 1                                                                                 | 6                                                                                 | 16   | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0                                                                                 | 0    | 0    | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                   | 1.00 | 1.00 |                                                                                   | 1.00 | 1.00                                                                              |                                                                                   | 1.00 | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1.00                                                                              | 1.00 | 1.00 | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1863                                                                              | 1900 | 1900 | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 212                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 16                                                                                | 9    | 65   | 5                                                                                 | 7    | 5                                                                                 | 2190                                                                              | 21   | 5                                                                                   | 2370                                                                                | 296                                                                                 |
| Adj No. of Lanes              | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1                                                                                 | 0    | 0    | 1                                                                                 | 0    | 1                                                                                 | 2                                                                                 | 0    | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.92                                                                              | 0.92 | 0.92 | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2                                                                                 | 2    | 2    | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 284                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 18                                                                                | 10   | 292  | 23                                                                                | 27   | 7                                                                                 | 2639                                                                              | 25   | 7                                                                                   | 2600                                                                                | 1163                                                                                |
| Arrive On Green               | 0.18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.18                                                                              | 0.17 | 0.18 | 0.18                                                                              | 0.17 | 0.01                                                                              | 0.98                                                                              | 0.97 | 0.00                                                                                | 0.73                                                                                | 0.73                                                                                |
| Sat Flow, veh/h               | 1326                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 100                                                                               | 56   | 1379 | 130                                                                               | 151  | 1774                                                                              | 3592                                                                              | 34   | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h          | 237                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0                                                                                 | 0    | 77   | 0                                                                                 | 0    | 5                                                                                 | 1077                                                                              | 1134 | 5                                                                                   | 2370                                                                                | 296                                                                                 |
| Grp Sat Flow(s),veh/h/ln      | 1482                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0                                                                                 | 0    | 1660 | 0                                                                                 | 0    | 1774                                                                              | 1770                                                                              | 1857 | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s               | 16.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.0                                                                               | 0.0  | 0.0  | 0.0                                                                               | 0.0  | 0.4                                                                               | 10.6                                                                              | 10.9 | 0.4                                                                                 | 78.0                                                                                | 8.8                                                                                 |
| Cycle Q Clear(g_c), s         | 22.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.0                                                                               | 0.0  | 5.6  | 0.0                                                                               | 0.0  | 0.4                                                                               | 10.6                                                                              | 10.9 | 0.4                                                                                 | 78.0                                                                                | 8.8                                                                                 |
| Prop In Lane                  | 0.89                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                   | 0.04 | 0.84 |                                                                                   | 0.09 | 1.00                                                                              |                                                                                   | 0.02 | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 312                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0                                                                                 | 0    | 343  | 0                                                                                 | 0    | 7                                                                                 | 1300                                                                              | 1364 | 7                                                                                   | 2600                                                                                | 1163                                                                                |
| V/C Ratio(X)                  | 0.76                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.00                                                                              | 0.00 | 0.22 | 0.00                                                                              | 0.00 | 0.75                                                                              | 0.83                                                                              | 0.83 | 0.75                                                                                | 0.91                                                                                | 0.25                                                                                |
| Avail Cap(c_a), veh/h         | 362                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0                                                                                 | 0    | 392  | 0                                                                                 | 0    | 37                                                                                | 1300                                                                              | 1364 | 37                                                                                  | 2600                                                                                | 1163                                                                                |
| HCM Platoon Ratio             | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1.00                                                                              | 1.00 | 1.00 | 1.00                                                                              | 1.00 | 1.33                                                                              | 1.33                                                                              | 1.33 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.00                                                                              | 0.00 | 1.00 | 0.00                                                                              | 0.00 | 0.45                                                                              | 0.45                                                                              | 0.45 | 0.19                                                                                | 0.19                                                                                | 0.19                                                                                |
| Uniform Delay (d), s/veh      | 57.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.0                                                                               | 0.0  | 51.2 | 0.0                                                                               | 0.0  | 72.1                                                                              | 0.6                                                                               | 0.6  | 72.2                                                                                | 15.5                                                                                | 6.3                                                                                 |
| Incr Delay (d2), s/veh        | 7.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.0                                                                               | 0.0  | 0.3  | 0.0                                                                               | 0.0  | 23.5                                                                              | 2.9                                                                               | 2.8  | 10.8                                                                                | 1.3                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.0                                                                               | 0.0  | 0.0  | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 10.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.0                                                                               | 0.0  | 2.7  | 0.0                                                                               | 0.0  | 0.2                                                                               | 4.2                                                                               | 4.8  | 0.2                                                                                 | 38.0                                                                                | 3.9                                                                                 |
| LnGrp Delay(d),s/veh          | 65.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.0                                                                               | 0.0  | 51.6 | 0.0                                                                               | 0.0  | 95.6                                                                              | 3.4                                                                               | 3.4  | 83.0                                                                                | 16.7                                                                                | 6.4                                                                                 |
| LnGrp LOS                     | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                   |      | D    |                                                                                   |      | F                                                                                 | A                                                                                 | A    | F                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h           | 237                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                   |      |      | 77                                                                                |      | 2216                                                                              |                                                                                   |      |                                                                                     | 2671                                                                                |                                                                                     |
| Approach Delay, s/veh         | 65.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                   |      |      | 51.6                                                                              |      | 3.6                                                                               |                                                                                   |      |                                                                                     | 15.7                                                                                |                                                                                     |
| Approach LOS                  | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                   |      |      | D                                                                                 |      | A                                                                                 |                                                                                   |      |                                                                                     | B                                                                                   |                                                                                     |
| Timer                         | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2                                                                                 | 3    | 4    | 5                                                                                 | 6    | 7                                                                                 | 8                                                                                 |      |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2                                                                                 |      |      | 4                                                                                 | 5    | 6                                                                                 | 8                                                                                 |      |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 4.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 110.5                                                                             |      |      | 29.9                                                                              | 4.5  | 110.5                                                                             | 29.9                                                                              |      |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 5.0                                                                               |      |      | 5.0                                                                               | 4.0  | 5.0                                                                               | 5.0                                                                               |      |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 3.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 98.0                                                                              |      |      | 30.0                                                                              | 3.0  | 98.0                                                                              | 30.0                                                                              |      |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.2), s | 12.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 80.0                                                                              |      |      | 7.6                                                                               | 2.4  | 12.9                                                                              | 24.5                                                                              |      |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 17.8                                                                              |      |      | 0.2                                                                               | 0.0  | 76.1                                                                              | 0.4                                                                               |      |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                   |      |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                   | 13.4 |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                   | B    |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 10: Honoapiilani Highway & Kapunakea Street

10/05/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |
| Traffic Volume (veh/h)        | 190                                                                               | 35                                                                                | 45                                                                                | 95                                                                                | 25                                                                                | 20                                                                                | 55                                                                                | 1800                                                                              | 105                                                                               | 30                                                                                  | 2105                                                                                | 160                                                                                 |
| Future Volume (veh/h)         | 190                                                                               | 35                                                                                | 45                                                                                | 95                                                                                | 25                                                                                | 20                                                                                | 55                                                                                | 1800                                                                              | 105                                                                               | 30                                                                                  | 2105                                                                                | 160                                                                                 |
| Number                        | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 0.98                                                                              |                                                                                   | 0.97                                                                              | 0.98                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h          | 207                                                                               | 38                                                                                | 14                                                                                | 103                                                                               | 27                                                                                | 2                                                                                 | 60                                                                                | 1957                                                                              | 111                                                                               | 33                                                                                  | 2288                                                                                | 170                                                                                 |
| Adj No. of Lanes              | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 272                                                                               | 231                                                                               | 85                                                                                | 253                                                                               | 307                                                                               | 23                                                                                | 73                                                                                | 2433                                                                              | 137                                                                               | 42                                                                                  | 2329                                                                                | 171                                                                                 |
| Arrive On Green               | 0.18                                                                              | 0.18                                                                              | 0.18                                                                              | 0.18                                                                              | 0.18                                                                              | 0.17                                                                              | 0.08                                                                              | 1.00                                                                              | 1.00                                                                              | 0.05                                                                                | 1.00                                                                                | 1.00                                                                                |
| Sat Flow, veh/h               | 1341                                                                              | 1289                                                                              | 475                                                                               | 1316                                                                              | 1710                                                                              | 127                                                                               | 1774                                                                              | 3407                                                                              | 191                                                                               | 1774                                                                                | 3343                                                                                | 245                                                                                 |
| Grp Volume(v), veh/h          | 207                                                                               | 0                                                                                 | 52                                                                                | 103                                                                               | 0                                                                                 | 29                                                                                | 60                                                                                | 1007                                                                              | 1061                                                                              | 33                                                                                  | 1197                                                                                | 1261                                                                                |
| Grp Sat Flow(s),veh/h/ln      | 1341                                                                              | 0                                                                                 | 1764                                                                              | 1316                                                                              | 0                                                                                 | 1836                                                                              | 1774                                                                              | 1770                                                                              | 1829                                                                              | 1774                                                                                | 1770                                                                                | 1819                                                                                |
| Q Serve(g_s), s               | 22.1                                                                              | 0.0                                                                               | 3.6                                                                               | 10.4                                                                              | 0.0                                                                               | 1.9                                                                               | 4.8                                                                               | 0.0                                                                               | 0.0                                                                               | 2.7                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Cycle Q Clear(g_c), s         | 24.0                                                                              | 0.0                                                                               | 3.6                                                                               | 14.0                                                                              | 0.0                                                                               | 1.9                                                                               | 4.8                                                                               | 0.0                                                                               | 0.0                                                                               | 2.7                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Prop In Lane                  | 1.00                                                                              |                                                                                   | 0.27                                                                              | 1.00                                                                              |                                                                                   | 0.07                                                                              | 1.00                                                                              |                                                                                   | 0.10                                                                              | 1.00                                                                                |                                                                                     | 0.13                                                                                |
| Lane Grp Cap(c), veh/h        | 272                                                                               | 0                                                                                 | 316                                                                               | 253                                                                               | 0                                                                                 | 329                                                                               | 73                                                                                | 1264                                                                              | 1306                                                                              | 42                                                                                  | 1233                                                                                | 1267                                                                                |
| V/C Ratio(X)                  | 0.76                                                                              | 0.00                                                                              | 0.16                                                                              | 0.41                                                                              | 0.00                                                                              | 0.09                                                                              | 0.82                                                                              | 0.80                                                                              | 0.81                                                                              | 0.79                                                                                | 0.97                                                                                | 1.00                                                                                |
| Avail Cap(c_a), veh/h         | 272                                                                               | 0                                                                                 | 316                                                                               | 253                                                                               | 0                                                                                 | 329                                                                               | 73                                                                                | 1264                                                                              | 1306                                                                              | 73                                                                                  | 1233                                                                                | 1267                                                                                |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 2.00                                                                              | 2.00                                                                              | 2.00                                                                              | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.13                                                                              | 0.13                                                                              | 0.13                                                                              | 0.29                                                                                | 0.29                                                                                | 0.29                                                                                |
| Uniform Delay (d), s/veh      | 59.6                                                                              | 0.0                                                                               | 50.3                                                                              | 56.2                                                                              | 0.0                                                                               | 49.6                                                                              | 66.0                                                                              | 0.0                                                                               | 0.0                                                                               | 68.7                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Incr Delay (d2), s/veh        | 11.7                                                                              | 0.0                                                                               | 0.2                                                                               | 1.1                                                                               | 0.0                                                                               | 0.1                                                                               | 8.8                                                                               | 0.7                                                                               | 0.8                                                                               | 3.5                                                                                 | 8.6                                                                                 | 12.5                                                                                |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 0.1                                                                               | 0.0                                                                               | 1.8                                                                               | 3.9                                                                               | 0.0                                                                               | 1.0                                                                               | 2.5                                                                               | 0.3                                                                               | 0.3                                                                               | 1.4                                                                                 | 2.9                                                                                 | 4.4                                                                                 |
| LnGrp Delay(d),s/veh          | 71.3                                                                              | 0.0                                                                               | 50.6                                                                              | 57.3                                                                              | 0.0                                                                               | 49.8                                                                              | 74.8                                                                              | 0.7                                                                               | 0.8                                                                               | 72.2                                                                                | 8.6                                                                                 | 12.5                                                                                |
| LnGrp LOS                     | E                                                                                 |                                                                                   | D                                                                                 | E                                                                                 |                                                                                   | D                                                                                 | E                                                                                 | A                                                                                 | A                                                                                 | E                                                                                   | A                                                                                   | B                                                                                   |
| Approach Vol, veh/h           | 259                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 132                                                                               |                                                                                   | 2128                                                                              |                                                                                   | 2491                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 67.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 55.6                                                                              |                                                                                   | 2.9                                                                               |                                                                                   | 11.4                                                                                |                                                                                     |                                                                                     |
| Approach LOS                  | E                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   | E                                                                                 |                                                                                   | A                                                                                 |                                                                                   | B                                                                                   |                                                                                     |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 |                                                                                   |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 10.0                                                                              | 105.0                                                                             |                                                                                   |                                                                                   | 30.0                                                                              | 7.4                                                                               | 107.6                                                                             | 30.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 100.0                                                                             | 100.0                                                                             |                                                                                   |                                                                                   | 25.0                                                                              | 6.0                                                                               | 100.0                                                                             | 25.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.0), s | 10.0                                                                              | 2.0                                                                               |                                                                                   |                                                                                   | 16.0                                                                              | 4.7                                                                               | 2.0                                                                               | 26.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.0                                                                               | 83.6                                                                              |                                                                                   |                                                                                   | 0.3                                                                               | 0.0                                                                               | 62.3                                                                              | 0.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           | 11.8                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 11: Honoapiilani Highway & Keawe Street

10/05/2017

|                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|--------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                       | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations            |                                                                                   |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)         | 65                                                                                | 185                                                                               | 60                                                                                | 125                                                                               | 110                                                                               | 735                                                                               | 55                                                                                | 1145                                                                              | 195                                                                               | 645                                                                                 | 1450                                                                                | 65                                                                                  |
| Future Volume (veh/h)          | 65                                                                                | 185                                                                               | 60                                                                                | 125                                                                               | 110                                                                               | 735                                                                               | 55                                                                                | 1145                                                                              | 195                                                                               | 645                                                                                 | 1450                                                                                | 65                                                                                  |
| Number                         | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)            | 0.98                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                                |                                                                                     | 0.99                                                                                |
| Parking Bus, Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln         | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h           | 71                                                                                | 201                                                                               | 8                                                                                 | 136                                                                               | 120                                                                               | 535                                                                               | 60                                                                                | 1245                                                                              | 137                                                                               | 701                                                                                 | 1576                                                                                | 69                                                                                  |
| Adj No. of Lanes               | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 2                                                                                 | 1                                                                                 | 2                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor               | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %           | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                     | 117                                                                               | 277                                                                               | 337                                                                               | 360                                                                               | 604                                                                               | 505                                                                               | 77                                                                                | 1367                                                                              | 607                                                                               | 712                                                                                 | 1899                                                                                | 83                                                                                  |
| Arrive On Green                | 0.22                                                                              | 0.22                                                                              | 0.22                                                                              | 0.08                                                                              | 0.32                                                                              | 0.32                                                                              | 0.04                                                                              | 0.39                                                                              | 0.39                                                                              | 0.41                                                                                | 1.00                                                                                | 1.00                                                                                |
| Sat Flow, veh/h                | 393                                                                               | 1272                                                                              | 1544                                                                              | 1774                                                                              | 1863                                                                              | 1557                                                                              | 1774                                                                              | 3539                                                                              | 1571                                                                              | 3442                                                                                | 3454                                                                                | 151                                                                                 |
| Grp Volume(v), veh/h           | 272                                                                               | 0                                                                                 | 8                                                                                 | 136                                                                               | 120                                                                               | 535                                                                               | 60                                                                                | 1245                                                                              | 137                                                                               | 701                                                                                 | 805                                                                                 | 840                                                                                 |
| Grp Sat Flow(s),veh/h/ln       | 1665                                                                              | 0                                                                                 | 1544                                                                              | 1774                                                                              | 1863                                                                              | 1557                                                                              | 1774                                                                              | 1770                                                                              | 1571                                                                              | 1721                                                                                | 1770                                                                                | 1835                                                                                |
| Q Serve(g_s), s                | 19.3                                                                              | 0.0                                                                               | 0.6                                                                               | 8.3                                                                               | 6.7                                                                               | 47.0                                                                              | 4.9                                                                               | 48.3                                                                              | 8.5                                                                               | 29.2                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Cycle Q Clear(g_c), s          | 22.0                                                                              | 0.0                                                                               | 0.6                                                                               | 8.3                                                                               | 6.7                                                                               | 47.0                                                                              | 4.9                                                                               | 48.3                                                                              | 8.5                                                                               | 29.2                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Prop In Lane                   | 0.26                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 0.08                                                                                |
| Lane Grp Cap(c), veh/h         | 394                                                                               | 0                                                                                 | 337                                                                               | 360                                                                               | 604                                                                               | 505                                                                               | 77                                                                                | 1367                                                                              | 607                                                                               | 712                                                                                 | 973                                                                                 | 1009                                                                                |
| V/C Ratio(X)                   | 0.69                                                                              | 0.00                                                                              | 0.02                                                                              | 0.38                                                                              | 0.20                                                                              | 1.06                                                                              | 0.78                                                                              | 0.91                                                                              | 0.23                                                                              | 0.98                                                                                | 0.83                                                                                | 0.83                                                                                |
| Avail Cap(c_a), veh/h          | 394                                                                               | 0                                                                                 | 337                                                                               | 404                                                                               | 604                                                                               | 505                                                                               | 122                                                                               | 1367                                                                              | 607                                                                               | 712                                                                                 | 973                                                                                 | 1009                                                                                |
| HCM Platoon Ratio              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                |
| Upstream Filter(I)             | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.88                                                                              | 0.88                                                                              | 0.88                                                                              | 0.13                                                                                | 0.13                                                                                | 0.13                                                                                |
| Uniform Delay (d), s/veh       | 52.8                                                                              | 0.0                                                                               | 44.6                                                                              | 37.3                                                                              | 35.4                                                                              | 49.0                                                                              | 68.7                                                                              | 42.1                                                                              | 29.9                                                                              | 42.3                                                                                | 0.0                                                                                 | 0.0                                                                                 |
| Incr Delay (d2), s/veh         | 5.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.7                                                                               | 0.2                                                                               | 56.9                                                                              | 5.7                                                                               | 9.6                                                                               | 0.8                                                                               | 9.1                                                                                 | 1.2                                                                                 | 1.2                                                                                 |
| Initial Q Delay(d3),s/veh      | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln       | 10.8                                                                              | 0.0                                                                               | 0.3                                                                               | 4.1                                                                               | 3.5                                                                               | 28.2                                                                              | 2.5                                                                               | 25.3                                                                              | 3.8                                                                               | 14.6                                                                                | 0.3                                                                                 | 0.3                                                                                 |
| LnGrp Delay(d),s/veh           | 57.8                                                                              | 0.0                                                                               | 44.6                                                                              | 38.0                                                                              | 35.6                                                                              | 105.9                                                                             | 74.4                                                                              | 51.7                                                                              | 30.7                                                                              | 51.4                                                                                | 1.2                                                                                 | 1.2                                                                                 |
| LnGrp LOS                      | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 | D                                                                                 | F                                                                                 | E                                                                                 | D                                                                                 | C                                                                                 | D                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h            | 280                                                                               |                                                                                   |                                                                                   |                                                                                   | 791                                                                               |                                                                                   |                                                                                   |                                                                                   | 1442                                                                              |                                                                                     | 2346                                                                                |                                                                                     |
| Approach Delay, s/veh          | 57.5                                                                              |                                                                                   |                                                                                   |                                                                                   | 83.6                                                                              |                                                                                   |                                                                                   |                                                                                   | 50.7                                                                              |                                                                                     | 16.2                                                                                |                                                                                     |
| Approach LOS                   | E                                                                                 |                                                                                   |                                                                                   |                                                                                   | F                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                     | B                                                                                   |                                                                                     |
| Timer                          | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                   | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s       | 30.3                                                                              | 83.7                                                                              | 15.4                                                                              | 35.6                                                                              | 34.0                                                                              | 60.0                                                                              | 51.0                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s        | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s    | 10.0                                                                              | 75.0                                                                              | 14.0                                                                              | 27.0                                                                              | 30.0                                                                              | 55.0                                                                              | 46.0                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+10.0), s | 10.0                                                                              | 2.0                                                                               | 10.3                                                                              | 24.0                                                                              | 31.2                                                                              | 50.3                                                                              | 49.0                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s        | 0.0                                                                               | 34.5                                                                              | 0.1                                                                               | 0.3                                                                               | 0.0                                                                               | 3.8                                                                               | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay            |                                                                                   |                                                                                   | 39.8                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

HCM 2010 TWSC  
12: RIRO Access & Honoapiilani Highway

10/05/2017

| Intersection             |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
|--------------------------|--------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh         | 0.5    |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
| Movement                 | WBL    | WBR                                                                               | NBT                                                                               | NBR                                                                               | SBL    | SBT                                                                                 |
| Lane Configurations      |        |  |  |  |        |  |
| Traffic Vol, veh/h       | 0      | 50                                                                                | 1005                                                                              | 65                                                                                | 0      | 1000                                                                                |
| Future Vol, veh/h        | 0      | 50                                                                                | 1005                                                                              | 65                                                                                | 0      | 1000                                                                                |
| Conflicting Peds, #/hr   | 0      | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0      | 0                                                                                   |
| Sign Control             | Stop   | Stop                                                                              | Free                                                                              | Free                                                                              | Free   | Free                                                                                |
| RT Channelized           | -      | None                                                                              | -                                                                                 | None                                                                              | -      | None                                                                                |
| Storage Length           | -      | 0                                                                                 | -                                                                                 | 0                                                                                 | -      | -                                                                                   |
| Veh in Median Storage, # | 0      | -                                                                                 | 0                                                                                 | -                                                                                 | -      | 0                                                                                   |
| Grade, %                 | 0      | -                                                                                 | 0                                                                                 | -                                                                                 | -      | 0                                                                                   |
| Peak Hour Factor         | 92     | 92                                                                                | 92                                                                                | 92                                                                                | 92     | 92                                                                                  |
| Heavy Vehicles, %        | 2      | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2      | 2                                                                                   |
| Mvmt Flow                | 0      | 54                                                                                | 1092                                                                              | 71                                                                                | 0      | 1087                                                                                |
|                          |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
| Major/Minor              | Minor1 |                                                                                   | Major1                                                                            |                                                                                   | Major2 |                                                                                     |
| Conflicting Flow All     | -      | 1092                                                                              | 0                                                                                 | 0                                                                                 | -      | -                                                                                   |
| Stage 1                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Stage 2                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Critical Hdwy            | -      | 6.22                                                                              | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Critical Hdwy Stg 1      | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Critical Hdwy Stg 2      | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Follow-up Hdwy           | -      | 3.318                                                                             | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Pot Cap-1 Maneuver       | 0      | 261                                                                               | -                                                                                 | -                                                                                 | 0      | -                                                                                   |
| Stage 1                  | 0      | -                                                                                 | -                                                                                 | -                                                                                 | 0      | -                                                                                   |
| Stage 2                  | 0      | -                                                                                 | -                                                                                 | -                                                                                 | 0      | -                                                                                   |
| Platoon blocked, %       |        |                                                                                   | -                                                                                 | -                                                                                 |        | -                                                                                   |
| Mov Cap-1 Maneuver       | -      | 261                                                                               | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Mov Cap-2 Maneuver       | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Stage 1                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Stage 2                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
|                          |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
| Approach                 | WB     |                                                                                   | NB                                                                                |                                                                                   | SB     |                                                                                     |
| HCM Control Delay, s     | 22.4   |                                                                                   | 0                                                                                 |                                                                                   | 0      |                                                                                     |
| HCM LOS                  | C      |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
|                          |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
| Minor Lane/Major Mvmt    | NBT    | NBRWBLn1                                                                          | SBT                                                                               |                                                                                   |        |                                                                                     |
| Capacity (veh/h)         | -      | - 261                                                                             | -                                                                                 |                                                                                   |        |                                                                                     |
| HCM Lane V/C Ratio       | -      | - 0.208                                                                           | -                                                                                 |                                                                                   |        |                                                                                     |
| HCM Control Delay (s)    | -      | - 22.4                                                                            | -                                                                                 |                                                                                   |        |                                                                                     |
| HCM Lane LOS             | -      | - C                                                                               | -                                                                                 |                                                                                   |        |                                                                                     |
| HCM 95th %tile Q(veh)    | -      | - 0.8                                                                             | -                                                                                 |                                                                                   |        |                                                                                     |

| Intersection               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
|----------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh           | 2                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Movement                   | WBL                                                                               | WBR                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 |
| Lane Configurations        |  |  |  |  |  |  |
| Traffic Vol, veh/h         | 55                                                                                | 30                                                                                | 1165                                                                              | 80                                                                                | 45                                                                                  | 1075                                                                                |
| Future Vol, veh/h          | 55                                                                                | 30                                                                                | 1165                                                                              | 80                                                                                | 45                                                                                  | 1075                                                                                |
| Conflicting Peds, #/hr     | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   |
| Sign Control               | Stop                                                                              | Stop                                                                              | Free                                                                              | Free                                                                              | Free                                                                                | Free                                                                                |
| RT Channelized             | -                                                                                 | None                                                                              | -                                                                                 | None                                                                              | -                                                                                   | None                                                                                |
| Storage Length             | 0                                                                                 | 100                                                                               | -                                                                                 | 100                                                                               | 100                                                                                 | -                                                                                   |
| Veh in Median Storage, #   | 0                                                                                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                   | 0                                                                                   |
| Grade, %                   | 0                                                                                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                   | 0                                                                                   |
| Peak Hour Factor           | 92                                                                                | 92                                                                                | 92                                                                                | 92                                                                                | 92                                                                                  | 92                                                                                  |
| Heavy Vehicles, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   |
| Mvmt Flow                  | 60                                                                                | 33                                                                                | 1266                                                                              | 87                                                                                | 49                                                                                  | 1168                                                                                |
|                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Major/Minor                | Minor1                                                                            |                                                                                   | Major1                                                                            |                                                                                   | Major2                                                                              |                                                                                     |
| Conflicting Flow All       | 2532                                                                              | 1266                                                                              | 0                                                                                 | 0                                                                                 | 1353                                                                                | 0                                                                                   |
| Stage 1                    | 1266                                                                              | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 2                    | 1266                                                                              | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Critical Hdwy              | 6.42                                                                              | 6.22                                                                              | -                                                                                 | -                                                                                 | 4.12                                                                                | -                                                                                   |
| Critical Hdwy Stg 1        | 5.42                                                                              | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Critical Hdwy Stg 2        | 5.42                                                                              | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Follow-up Hdwy             | 3.518                                                                             | 3.318                                                                             | -                                                                                 | -                                                                                 | 2.218                                                                               | -                                                                                   |
| Pot Cap-1 Maneuver         | ~ 30                                                                              | 206                                                                               | -                                                                                 | -                                                                                 | 509                                                                                 | -                                                                                   |
| Stage 1                    | 265                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 2                    | 265                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Platoon blocked, %         |                                                                                   |                                                                                   | -                                                                                 | -                                                                                 |                                                                                     | -                                                                                   |
| Mov Cap-1 Maneuver         | ~ 27                                                                              | 206                                                                               | -                                                                                 | -                                                                                 | 509                                                                                 | -                                                                                   |
| Mov Cap-2 Maneuver         | 116                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 1                    | 240                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 2                    | 265                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
|                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Approach                   | WB                                                                                |                                                                                   | NB                                                                                |                                                                                   | SB                                                                                  |                                                                                     |
| HCM Control Delay, s       | 51.3                                                                              |                                                                                   | 0                                                                                 |                                                                                   | 0.5                                                                                 |                                                                                     |
| HCM LOS                    | F                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
|                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Minor Lane/Major Mvmt      | NBT                                                                               | NBR                                                                               | WBLn1                                                                             | WBLn2                                                                             | SBL                                                                                 | SBT                                                                                 |
| Capacity (veh/h)           | -                                                                                 | -                                                                                 | 116                                                                               | 206                                                                               | 509                                                                                 | -                                                                                   |
| HCM Lane V/C Ratio         | -                                                                                 | -                                                                                 | 0.515                                                                             | 0.158                                                                             | 0.096                                                                               | -                                                                                   |
| HCM Control Delay (s)      | -                                                                                 | -                                                                                 | 65.2                                                                              | 25.7                                                                              | 12.8                                                                                | -                                                                                   |
| HCM Lane LOS               | -                                                                                 | -                                                                                 | F                                                                                 | D                                                                                 | B                                                                                   | -                                                                                   |
| HCM 95th %tile Q(veh)      | -                                                                                 | -                                                                                 | 2.4                                                                               | 0.6                                                                               | 0.3                                                                                 | -                                                                                   |
| Notes                      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| ~: Volume exceeds capacity |                                                                                   | \$: Delay exceeds 300s                                                            |                                                                                   | +: Computation Not Defined                                                        |                                                                                     | *: All major volume in platoon                                                      |

HCM 2010 TWSC  
14: Road A & Akahele Street

10/05/2017

| Intersection             |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|--------|-------------------------------------------------------------------------------------|-------|--------|-------------------------------------------------------------------------------------|-------|
| Int Delay, s/veh         | 7.8                                                                               |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Movement                 | EBL                                                                               | EBT                                                                               | EBR  | WBL                                                                               | WBT                                                                               | WBR  | NBL    | NBT                                                                                 | NBR   | SBL    | SBT                                                                                 | SBR   |
| Lane Configurations      |  |  |      |  |  |      |        |  |       |        |  |       |
| Traffic Vol, veh/h       | 120                                                                               | 85                                                                                | 130  | 5                                                                                 | 65                                                                                | 10   | 115    | 10                                                                                  | 15    | 30     | 10                                                                                  | 100   |
| Future Vol, veh/h        | 120                                                                               | 85                                                                                | 130  | 5                                                                                 | 65                                                                                | 10   | 115    | 10                                                                                  | 15    | 30     | 10                                                                                  | 100   |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0      | 0                                                                                   | 0     | 0      | 0                                                                                   | 0     |
| Sign Control             | Free                                                                              | Free                                                                              | Free | Free                                                                              | Free                                                                              | Free | Stop   | Stop                                                                                | Stop  | Stop   | Stop                                                                                | Stop  |
| RT Channelized           | -                                                                                 | -                                                                                 | None | -                                                                                 | -                                                                                 | None | -      | -                                                                                   | None  | -      | -                                                                                   | None  |
| Storage Length           | 100                                                                               | -                                                                                 | -    | 100                                                                               | -                                                                                 | -    | -      | -                                                                                   | -     | -      | -                                                                                   | -     |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | -    | -                                                                                 | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Grade, %                 | -                                                                                 | 0                                                                                 | -    | -                                                                                 | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Peak Hour Factor         | 92                                                                                | 92                                                                                | 92   | 92                                                                                | 92                                                                                | 92   | 92     | 92                                                                                  | 92    | 92     | 92                                                                                  | 92    |
| Heavy Vehicles, %        | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    | 2      | 2                                                                                   | 2     | 2      | 2                                                                                   | 2     |
| Mvmt Flow                | 130                                                                               | 92                                                                                | 141  | 5                                                                                 | 71                                                                                | 11   | 125    | 11                                                                                  | 16    | 33     | 11                                                                                  | 109   |
|                          |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Major/Minor              | Major1                                                                            |                                                                                   |      | Major2                                                                            |                                                                                   |      | Minor1 |                                                                                     |       | Minor2 |                                                                                     |       |
| Conflicting Flow All     | 82                                                                                | 0                                                                                 | 0    | 233                                                                               | 0                                                                                 | 0    | 570    | 515                                                                                 | 163   | 523    | 580                                                                                 | 77    |
| Stage 1                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 423    | 423                                                                                 | -     | 87     | 87                                                                                  | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 147    | 92                                                                                  | -     | 436    | 493                                                                                 | -     |
| Critical Hdwy            | 4.12                                                                              | -                                                                                 | -    | 4.12                                                                              | -                                                                                 | -    | 7.12   | 6.52                                                                                | 6.22  | 7.12   | 6.52                                                                                | 6.22  |
| Critical Hdwy Stg 1      | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Critical Hdwy Stg 2      | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Follow-up Hdwy           | 2.218                                                                             | -                                                                                 | -    | 2.218                                                                             | -                                                                                 | -    | 3.518  | 4.018                                                                               | 3.318 | 3.518  | 4.018                                                                               | 3.318 |
| Pot Cap-1 Maneuver       | 1515                                                                              | -                                                                                 | -    | 1335                                                                              | -                                                                                 | -    | 432    | 464                                                                                 | 882   | 465    | 426                                                                                 | 984   |
| Stage 1                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 609    | 588                                                                                 | -     | 921    | 823                                                                                 | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 856    | 819                                                                                 | -     | 599    | 547                                                                                 | -     |
| Platoon blocked, %       |                                                                                   | -                                                                                 | -    |                                                                                   | -                                                                                 | -    |        |                                                                                     |       |        |                                                                                     |       |
| Mov Cap-1 Maneuver       | 1515                                                                              | -                                                                                 | -    | 1335                                                                              | -                                                                                 | -    | 350    | 422                                                                                 | 882   | 417    | 388                                                                                 | 984   |
| Mov Cap-2 Maneuver       | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 350    | 422                                                                                 | -     | 417    | 388                                                                                 | -     |
| Stage 1                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 557    | 537                                                                                 | -     | 842    | 820                                                                                 | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 749    | 816                                                                                 | -     | 527    | 500                                                                                 | -     |
|                          |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Approach                 | EB                                                                                |                                                                                   |      | WB                                                                                |                                                                                   |      | NB     |                                                                                     |       | SB     |                                                                                     |       |
| HCM Control Delay, s     | 2.7                                                                               |                                                                                   |      | 0.5                                                                               |                                                                                   |      | 20.7   |                                                                                     |       | 11.5   |                                                                                     |       |
| HCM LOS                  |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      | C      |                                                                                     |       | B      |                                                                                     |       |
|                          |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Minor Lane/Major Mvmt    | NBLn1                                                                             | EBL                                                                               | EBT  | EBR                                                                               | WBL                                                                               | WBT  | WBR    | SBLn1                                                                               |       |        |                                                                                     |       |
| Capacity (veh/h)         | 379                                                                               | 1515                                                                              | -    | -                                                                                 | 1335                                                                              | -    | -      | 702                                                                                 |       |        |                                                                                     |       |
| HCM Lane V/C Ratio       | 0.402                                                                             | 0.086                                                                             | -    | -                                                                                 | 0.004                                                                             | -    | -      | 0.217                                                                               |       |        |                                                                                     |       |
| HCM Control Delay (s)    | 20.7                                                                              | 7.6                                                                               | -    | -                                                                                 | 7.7                                                                               | -    | -      | 11.5                                                                                |       |        |                                                                                     |       |
| HCM Lane LOS             | C                                                                                 | A                                                                                 | -    | -                                                                                 | A                                                                                 | -    | -      | B                                                                                   |       |        |                                                                                     |       |
| HCM 95th %tile Q(veh)    | 1.9                                                                               | 0.3                                                                               | -    | -                                                                                 | 0                                                                                 | -    | -      | 0.8                                                                                 |       |        |                                                                                     |       |

| Intersection             |        |              |      |        |              |      |        |              |       |        |              |       |
|--------------------------|--------|--------------|------|--------|--------------|------|--------|--------------|-------|--------|--------------|-------|
| Int Delay, s/veh         | 4.2    |              |      |        |              |      |        |              |       |        |              |       |
| Movement                 | EBL    | EBT          | EBR  | WBL    | WBT          | WBR  | NBL    | NBT          | NBR   | SBL    | SBT          | SBR   |
| Lane Configurations      |        | <div>↕</div> |      |        | <div>↕</div> |      |        | <div>↕</div> |       |        | <div>↕</div> |       |
| Traffic Vol, veh/h       | 30     | 15           | 90   | 5      | 20           | 5    | 45     | 5            | 5     | 5      | 5            | 15    |
| Future Vol, veh/h        | 30     | 15           | 90   | 5      | 20           | 5    | 45     | 5            | 5     | 5      | 5            | 15    |
| Conflicting Peds, #/hr   | 0      | 0            | 0    | 0      | 0            | 0    | 0      | 0            | 0     | 0      | 0            | 0     |
| Sign Control             | Free   | Free         | Free | Free   | Free         | Free | Stop   | Stop         | Stop  | Stop   | Stop         | Stop  |
| RT Channelized           | -      | -            | None | -      | -            | None | -      | -            | None  | -      | -            | None  |
| Storage Length           | -      | -            | -    | -      | -            | -    | -      | -            | -     | -      | -            | -     |
| Veh in Median Storage, # | -      | 0            | -    | -      | 0            | -    | -      | 0            | -     | -      | 0            | -     |
| Grade, %                 | -      | 0            | -    | -      | 0            | -    | -      | 0            | -     | -      | 0            | -     |
| Peak Hour Factor         | 92     | 92           | 92   | 92     | 92           | 92   | 92     | 92           | 92    | 92     | 92           | 92    |
| Heavy Vehicles, %        | 2      | 2            | 2    | 2      | 2            | 2    | 2      | 2            | 2     | 2      | 2            | 2     |
| Mvmt Flow                | 33     | 16           | 98   | 5      | 22           | 5    | 49     | 5            | 5     | 5      | 5            | 16    |
|                          |        |              |      |        |              |      |        |              |       |        |              |       |
| Major/Minor              | Major1 |              |      | Major2 |              |      | Minor1 |              |       | Minor2 |              |       |
| Conflicting Flow All     | 27     | 0            | 0    | 114    | 0            | 0    | 176    | 168          | 65    | 171    | 215          | 25    |
| Stage 1                  | -      | -            | -    | -      | -            | -    | 131    | 131          | -     | 35     | 35           | -     |
| Stage 2                  | -      | -            | -    | -      | -            | -    | 45     | 37           | -     | 136    | 180          | -     |
| Critical Hdwy            | 4.12   | -            | -    | 4.12   | -            | -    | 7.12   | 6.52         | 6.22  | 7.12   | 6.52         | 6.22  |
| Critical Hdwy Stg 1      | -      | -            | -    | -      | -            | -    | 6.12   | 5.52         | -     | 6.12   | 5.52         | -     |
| Critical Hdwy Stg 2      | -      | -            | -    | -      | -            | -    | 6.12   | 5.52         | -     | 6.12   | 5.52         | -     |
| Follow-up Hdwy           | 2.218  | -            | -    | 2.218  | -            | -    | 3.518  | 4.018        | 3.318 | 3.518  | 4.018        | 3.318 |
| Pot Cap-1 Maneuver       | 1587   | -            | -    | 1475   | -            | -    | 786    | 725          | 999   | 792    | 683          | 1051  |
| Stage 1                  | -      | -            | -    | -      | -            | -    | 873    | 788          | -     | 981    | 866          | -     |
| Stage 2                  | -      | -            | -    | -      | -            | -    | 969    | 864          | -     | 867    | 750          | -     |
| Platoon blocked, %       |        | -            | -    |        | -            | -    |        |              |       |        |              |       |
| Mov Cap-1 Maneuver       | 1587   | -            | -    | 1475   | -            | -    | 755    | 707          | 999   | 768    | 666          | 1051  |
| Mov Cap-2 Maneuver       | -      | -            | -    | -      | -            | -    | 755    | 707          | -     | 768    | 666          | -     |
| Stage 1                  | -      | -            | -    | -      | -            | -    | 854    | 771          | -     | 959    | 863          | -     |
| Stage 2                  | -      | -            | -    | -      | -            | -    | 945    | 861          | -     | 837    | 734          | -     |
|                          |        |              |      |        |              |      |        |              |       |        |              |       |
| Approach                 | EB     |              |      | WB     |              |      | NB     |              |       | SB     |              |       |
| HCM Control Delay, s     | 1.6    |              |      | 1.2    |              |      | 10.1   |              |       | 9.2    |              |       |
| HCM LOS                  |        |              |      |        |              |      | B      |              |       | A      |              |       |
|                          |        |              |      |        |              |      |        |              |       |        |              |       |
| Minor Lane/Major Mvmt    | NBLn1  | EBL          | EBT  | EBR    | WBL          | WBT  | WBR    | SBLn1        |       |        |              |       |
| Capacity (veh/h)         | 767    | 1587         | -    | -      | 1475         | -    | -      | 884          |       |        |              |       |
| HCM Lane V/C Ratio       | 0.078  | 0.021        | -    | -      | 0.004        | -    | -      | 0.031        |       |        |              |       |
| HCM Control Delay (s)    | 10.1   | 7.3          | 0    | -      | 7.5          | 0    | -      | 9.2          |       |        |              |       |
| HCM Lane LOS             | B      | A            | A    | -      | A            | A    | -      | A            |       |        |              |       |
| HCM 95th %tile O(veh)    | 0.3    | 0.1          | -    | -      | 0            | -    | -      | 0.1          |       |        |              |       |

| Intersection             |                                                                                   |      |        |                                                                                   |                                                                                     |       |
|--------------------------|-----------------------------------------------------------------------------------|------|--------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------|
| Int Delay, s/veh         | 1.9                                                                               |      |        |                                                                                   |                                                                                     |       |
| Movement                 | EBT                                                                               | EBR  | WBL    | WBT                                                                               | NBL                                                                                 | NBR   |
| Lane Configurations      |  |      |        |  |  |       |
| Traffic Vol, veh/h       | 85                                                                                | 40   | 5      | 45                                                                                | 35                                                                                  | 5     |
| Future Vol, veh/h        | 85                                                                                | 40   | 5      | 45                                                                                | 35                                                                                  | 5     |
| Conflicting Peds, #/hr   | 0                                                                                 | 0    | 0      | 0                                                                                 | 0                                                                                   | 0     |
| Sign Control             | Free                                                                              | Free | Free   | Free                                                                              | Stop                                                                                | Stop  |
| RT Channelized           | -                                                                                 | None | -      | None                                                                              | -                                                                                   | None  |
| Storage Length           | -                                                                                 | -    | -      | -                                                                                 | 0                                                                                   | -     |
| Veh in Median Storage, # | 0                                                                                 | -    | -      | 0                                                                                 | 0                                                                                   | -     |
| Grade, %                 | 0                                                                                 | -    | -      | 0                                                                                 | 0                                                                                   | -     |
| Peak Hour Factor         | 92                                                                                | 92   | 92     | 92                                                                                | 92                                                                                  | 92    |
| Heavy Vehicles, %        | 2                                                                                 | 2    | 2      | 2                                                                                 | 2                                                                                   | 2     |
| Mvmt Flow                | 92                                                                                | 43   | 5      | 49                                                                                | 38                                                                                  | 5     |
| Major/Minor              | Major1                                                                            |      | Major2 |                                                                                   | Minor1                                                                              |       |
| Conflicting Flow All     | 0                                                                                 | 0    | 135    | 0                                                                                 | 173                                                                                 | 114   |
| Stage 1                  | -                                                                                 | -    | -      | -                                                                                 | 114                                                                                 | -     |
| Stage 2                  | -                                                                                 | -    | -      | -                                                                                 | 59                                                                                  | -     |
| Critical Hdwy            | -                                                                                 | -    | 4.12   | -                                                                                 | 6.42                                                                                | 6.22  |
| Critical Hdwy Stg 1      | -                                                                                 | -    | -      | -                                                                                 | 5.42                                                                                | -     |
| Critical Hdwy Stg 2      | -                                                                                 | -    | -      | -                                                                                 | 5.42                                                                                | -     |
| Follow-up Hdwy           | -                                                                                 | -    | 2.218  | -                                                                                 | 3.518                                                                               | 3.318 |
| Pot Cap-1 Maneuver       | -                                                                                 | -    | 1449   | -                                                                                 | 817                                                                                 | 939   |
| Stage 1                  | -                                                                                 | -    | -      | -                                                                                 | 911                                                                                 | -     |
| Stage 2                  | -                                                                                 | -    | -      | -                                                                                 | 964                                                                                 | -     |
| Platoon blocked, %       | -                                                                                 | -    | -      | -                                                                                 | -                                                                                   | -     |
| Mov Cap-1 Maneuver       | -                                                                                 | -    | 1449   | -                                                                                 | 814                                                                                 | 939   |
| Mov Cap-2 Maneuver       | -                                                                                 | -    | -      | -                                                                                 | 814                                                                                 | -     |
| Stage 1                  | -                                                                                 | -    | -      | -                                                                                 | 907                                                                                 | -     |
| Stage 2                  | -                                                                                 | -    | -      | -                                                                                 | 964                                                                                 | -     |
| Approach                 | EB                                                                                |      | WB     |                                                                                   | NB                                                                                  |       |
| HCM Control Delay, s     | 0                                                                                 |      | 0.7    |                                                                                   | 9.6                                                                                 |       |
| HCM LOS                  |                                                                                   |      |        |                                                                                   | A                                                                                   |       |
| Minor Lane/Major Mvmt    | NBLn1                                                                             | EBT  | EBR    | WBL                                                                               | WBT                                                                                 |       |
| Capacity (veh/h)         | 828                                                                               | -    | -      | 1449                                                                              | -                                                                                   |       |
| HCM Lane V/C Ratio       | 0.053                                                                             | -    | -      | 0.004                                                                             | -                                                                                   |       |
| HCM Control Delay (s)    | 9.6                                                                               | -    | -      | 7.5                                                                               | 0                                                                                   |       |
| HCM Lane LOS             | A                                                                                 | -    | -      | A                                                                                 | A                                                                                   |       |
| HCM 95th %tile Q(veh)    | 0.2                                                                               | -    | -      | 0                                                                                 | -                                                                                   |       |

HCM 2010 Roundabout  
17: Road F & Road J

10/05/2017

| Intersection                |       |       |       |
|-----------------------------|-------|-------|-------|
| Intersection Delay, s/veh   | 3.9   |       |       |
| Intersection LOS            | A     |       |       |
| Approach                    | EB    | WB    | NB    |
| Entry Lanes                 | 1     | 1     | 1     |
| Conflicting Circle Lanes    | 1     | 1     | 1     |
| Adj Approach Flow, veh/h    | 97    | 32    | 27    |
| Demand Flow Rate, veh/h     | 99    | 33    | 27    |
| Vehicles Circulating, veh/h | 5     | 22    | 55    |
| Vehicles Exiting, veh/h     | 50    | 60    | 49    |
| Follow-Up Headway, s        | 3.186 | 3.186 | 3.186 |
| Ped Vol Crossing Leg, #/h   | 0     | 0     | 0     |
| Ped Cap Adj                 | 1.000 | 1.000 | 1.000 |
| Approach Delay, s/veh       | 4.0   | 3.6   | 3.6   |
| Approach LOS                | A     | A     | A     |
| Lane                        | Left  | Left  | Left  |
| Designated Moves            | TR    | LT    | LR    |
| Assumed Moves               | TR    | LT    | LR    |
| RT Channelized              |       |       |       |
| Lane Util                   | 1.000 | 1.000 | 1.000 |
| Critical Headway, s         | 5.193 | 5.193 | 5.193 |
| Entry Flow, veh/h           | 99    | 33    | 27    |
| Cap Entry Lane, veh/h       | 1124  | 1105  | 1069  |
| Entry HV Adj Factor         | 0.979 | 0.983 | 1.000 |
| Flow Entry, veh/h           | 97    | 32    | 27    |
| Cap Entry, veh/h            | 1101  | 1087  | 1069  |
| V/C Ratio                   | 0.088 | 0.030 | 0.025 |
| Control Delay, s/veh        | 4.0   | 3.6   | 3.6   |
| LOS                         | A     | A     | A     |
| 95th %tile Queue, veh       | 0     | 0     | 0     |





---

## **APPENDIX C**

### LEVEL OF SERVICE CALCULATIONS

- Future Year 2027 Scenario 4 WE Peak
-

# HCM 2010 Signalized Intersection Summary

## 1: Napilihau Street

10/05/2017

|                              |  |  |  |  |  |  |   |  |  |  |  |  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)       | 40                                                                                | 45                                                                                | 385                                                                               | 50                                                                                | 50                                                                                | 20                                                                                | 325                                                                                 | 435                                                                                 | 45                                                                                  | 20                                                                                  | 400                                                                                 | 90                                                                                  |
| Future Volume (veh/h)        | 40                                                                                | 45                                                                                | 385                                                                               | 50                                                                                | 50                                                                                | 20                                                                                | 325                                                                                 | 435                                                                                 | 45                                                                                  | 20                                                                                  | 400                                                                                 | 90                                                                                  |
| Number                       | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.99                                                                              |                                                                                   | 0.99                                                                              | 0.99                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 43                                                                                | 49                                                                                | 31                                                                                | 54                                                                                | 54                                                                                | 10                                                                                | 353                                                                                 | 473                                                                                 | 29                                                                                  | 22                                                                                  | 435                                                                                 | 33                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 160                                                                               | 127                                                                               | 192                                                                               | 218                                                                               | 187                                                                               | 35                                                                                | 427                                                                                 | 1074                                                                                | 911                                                                                 | 28                                                                                  | 654                                                                                 | 555                                                                                 |
| Arrive On Green              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              | 0.24                                                                                | 0.58                                                                                | 0.58                                                                                | 0.02                                                                                | 0.35                                                                                | 0.35                                                                                |
| Sat Flow, veh/h              | 539                                                                               | 1033                                                                              | 1564                                                                              | 1302                                                                              | 1526                                                                              | 283                                                                               | 1774                                                                                | 1863                                                                                | 1581                                                                                | 1774                                                                                | 1863                                                                                | 1581                                                                                |
| Grp Volume(v), veh/h         | 92                                                                                | 0                                                                                 | 31                                                                                | 54                                                                                | 0                                                                                 | 64                                                                                | 353                                                                                 | 473                                                                                 | 29                                                                                  | 22                                                                                  | 435                                                                                 | 33                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1572                                                                              | 0                                                                                 | 1564                                                                              | 1302                                                                              | 0                                                                                 | 1809                                                                              | 1774                                                                                | 1863                                                                                | 1581                                                                                | 1774                                                                                | 1863                                                                                | 1581                                                                                |
| Q Serve(g_s), s              | 1.2                                                                               | 0.0                                                                               | 1.0                                                                               | 2.3                                                                               | 0.0                                                                               | 1.8                                                                               | 10.6                                                                                | 8.1                                                                                 | 0.4                                                                                 | 0.7                                                                                 | 11.1                                                                                | 0.8                                                                                 |
| Cycle Q Clear(g_c), s        | 3.0                                                                               | 0.0                                                                               | 1.0                                                                               | 5.3                                                                               | 0.0                                                                               | 1.8                                                                               | 10.6                                                                                | 8.1                                                                                 | 0.4                                                                                 | 0.7                                                                                 | 11.1                                                                                | 0.8                                                                                 |
| Prop In Lane                 | 0.47                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.16                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 287                                                                               | 0                                                                                 | 192                                                                               | 218                                                                               | 0                                                                                 | 222                                                                               | 427                                                                                 | 1074                                                                                | 911                                                                                 | 28                                                                                  | 654                                                                                 | 555                                                                                 |
| V/C Ratio(X)                 | 0.32                                                                              | 0.00                                                                              | 0.16                                                                              | 0.25                                                                              | 0.00                                                                              | 0.29                                                                              | 0.83                                                                                | 0.44                                                                                | 0.03                                                                                | 0.80                                                                                | 0.66                                                                                | 0.06                                                                                |
| Avail Cap(c_a), veh/h        | 764                                                                               | 0                                                                                 | 670                                                                               | 615                                                                               | 0                                                                                 | 774                                                                               | 949                                                                                 | 2625                                                                                | 2227                                                                                | 475                                                                                 | 2127                                                                                | 1805                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 22.8                                                                              | 0.0                                                                               | 22.0                                                                              | 25.4                                                                              | 0.0                                                                               | 22.4                                                                              | 20.2                                                                                | 6.7                                                                                 | 5.1                                                                                 | 27.5                                                                                | 15.4                                                                                | 12.0                                                                                |
| Incr Delay (d2), s/veh       | 0.6                                                                               | 0.0                                                                               | 0.4                                                                               | 0.6                                                                               | 0.0                                                                               | 0.7                                                                               | 4.1                                                                                 | 0.6                                                                                 | 0.0                                                                                 | 39.1                                                                                | 2.5                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.4                                                                               | 0.0                                                                               | 0.4                                                                               | 0.8                                                                               | 0.0                                                                               | 0.9                                                                               | 5.6                                                                                 | 4.3                                                                                 | 0.2                                                                                 | 0.6                                                                                 | 6.1                                                                                 | 0.4                                                                                 |
| LnGrp Delay(d),s/veh         | 23.5                                                                              | 0.0                                                                               | 22.4                                                                              | 26.0                                                                              | 0.0                                                                               | 23.1                                                                              | 24.3                                                                                | 7.3                                                                                 | 5.2                                                                                 | 66.7                                                                                | 17.9                                                                                | 12.1                                                                                |
| LnGrp LOS                    | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                   | A                                                                                   | A                                                                                   | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          |                                                                                   | 123                                                                               |                                                                                   |                                                                                   | 118                                                                               |                                                                                   |                                                                                     | 855                                                                                 |                                                                                     |                                                                                     | 490                                                                                 |                                                                                     |
| Approach Delay, s/veh        |                                                                                   | 23.2                                                                              |                                                                                   |                                                                                   | 24.4                                                                              |                                                                                   |                                                                                     | 14.3                                                                                |                                                                                     |                                                                                     | 19.7                                                                                |                                                                                     |
| Approach LOS                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 5.9                                                                               | 38.3                                                                              |                                                                                   | 11.9                                                                              | 18.5                                                                              | 25.7                                                                              |                                                                                     | 11.9                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 5.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               |                                                                                     | 5.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 15.0                                                                              | 79.0                                                                              |                                                                                   | 24.0                                                                              | 30.0                                                                              | 64.0                                                                              |                                                                                     | 24.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+I1), s | 2.7                                                                               | 10.1                                                                              |                                                                                   | 5.0                                                                               | 12.6                                                                              | 13.1                                                                              |                                                                                     | 7.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 7.4                                                                               |                                                                                   | 0.5                                                                               | 1.0                                                                               | 6.5                                                                               |                                                                                     | 0.4                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| <b>Intersection Summary</b>  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 17.4                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 2: Hoohui Road

10/05/2017

|                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|--------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                       | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations            |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)         | 55                                                                                | 20                                                                                | 245                                                                               | 50                                                                                | 15                                                                                | 5                                                                                 | 170                                                                               | 630                                                                               | 35                                                                                | 15                                                                                  | 670                                                                                 | 60                                                                                  |
| Future Volume (veh/h)          | 55                                                                                | 20                                                                                | 245                                                                               | 50                                                                                | 15                                                                                | 5                                                                                 | 170                                                                               | 630                                                                               | 35                                                                                | 15                                                                                  | 670                                                                                 | 60                                                                                  |
| Number                         | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                 | 2                                                                                 | 12                                                                                | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh            | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)            | 0.98                                                                              |                                                                                   | 0.98                                                                              | 0.99                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln         | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h           | 60                                                                                | 22                                                                                | 19                                                                                | 54                                                                                | 16                                                                                | 1                                                                                 | 185                                                                               | 685                                                                               | 0                                                                                 | 16                                                                                  | 728                                                                                 | 29                                                                                  |
| Adj No. of Lanes               | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor               | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %           | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                     | 252                                                                               | 75                                                                                | 219                                                                               | 259                                                                               | 244                                                                               | 15                                                                                | 386                                                                               | 1028                                                                              | 874                                                                               | 373                                                                                 | 890                                                                                 | 754                                                                                 |
| Arrive On Green                | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.09                                                                              | 0.55                                                                              | 0.00                                                                              | 0.01                                                                                | 0.48                                                                                | 0.48                                                                                |
| Sat Flow, veh/h                | 974                                                                               | 535                                                                               | 1555                                                                              | 1341                                                                              | 1733                                                                              | 108                                                                               | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1578                                                                                |
| Grp Volume(v), veh/h           | 82                                                                                | 0                                                                                 | 19                                                                                | 54                                                                                | 0                                                                                 | 17                                                                                | 185                                                                               | 685                                                                               | 0                                                                                 | 16                                                                                  | 728                                                                                 | 29                                                                                  |
| Grp Sat Flow(s),veh/h/ln       | 1509                                                                              | 0                                                                                 | 1555                                                                              | 1341                                                                              | 0                                                                                 | 1841                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                                | 1863                                                                                | 1578                                                                                |
| Q Serve(g_s), s                | 1.8                                                                               | 0.0                                                                               | 0.6                                                                               | 2.1                                                                               | 0.0                                                                               | 0.4                                                                               | 2.6                                                                               | 14.1                                                                              | 0.0                                                                               | 0.3                                                                                 | 18.2                                                                                | 0.5                                                                                 |
| Cycle Q Clear(g_c), s          | 2.5                                                                               | 0.0                                                                               | 0.6                                                                               | 4.6                                                                               | 0.0                                                                               | 0.4                                                                               | 2.6                                                                               | 14.1                                                                              | 0.0                                                                               | 0.3                                                                                 | 18.2                                                                                | 0.5                                                                                 |
| Prop In Lane                   | 0.73                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.06                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h         | 328                                                                               | 0                                                                                 | 219                                                                               | 259                                                                               | 0                                                                                 | 260                                                                               | 386                                                                               | 1028                                                                              | 874                                                                               | 373                                                                                 | 890                                                                                 | 754                                                                                 |
| V/C Ratio(X)                   | 0.25                                                                              | 0.00                                                                              | 0.09                                                                              | 0.21                                                                              | 0.00                                                                              | 0.07                                                                              | 0.48                                                                              | 0.67                                                                              | 0.00                                                                              | 0.04                                                                                | 0.82                                                                                | 0.04                                                                                |
| Avail Cap(c_a), veh/h          | 799                                                                               | 0                                                                                 | 717                                                                               | 688                                                                               | 0                                                                                 | 849                                                                               | 724                                                                               | 1752                                                                              | 1489                                                                              | 843                                                                                 | 1752                                                                                | 1484                                                                                |
| HCM Platoon Ratio              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)             | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh       | 21.0                                                                              | 0.0                                                                               | 20.3                                                                              | 23.2                                                                              | 0.0                                                                               | 20.2                                                                              | 9.9                                                                               | 8.6                                                                               | 0.0                                                                               | 8.1                                                                                 | 12.1                                                                                | 7.5                                                                                 |
| Incr Delay (d2), s/veh         | 0.4                                                                               | 0.0                                                                               | 0.2                                                                               | 0.4                                                                               | 0.0                                                                               | 0.1                                                                               | 0.9                                                                               | 0.8                                                                               | 0.0                                                                               | 0.0                                                                                 | 1.9                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh      | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln       | 1.2                                                                               | 0.0                                                                               | 0.3                                                                               | 0.8                                                                               | 0.0                                                                               | 0.2                                                                               | 1.4                                                                               | 7.3                                                                               | 0.0                                                                               | 0.1                                                                                 | 9.6                                                                                 | 0.2                                                                                 |
| LnGrp Delay(d),s/veh           | 21.4                                                                              | 0.0                                                                               | 20.4                                                                              | 23.6                                                                              | 0.0                                                                               | 20.3                                                                              | 10.8                                                                              | 9.4                                                                               | 0.0                                                                               | 8.1                                                                                 | 14.1                                                                                | 7.6                                                                                 |
| LnGrp LOS                      | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                 |                                                                                   | C                                                                                 | B                                                                                 | A                                                                                 |                                                                                   | A                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h            | 101                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 71                                                                                | 870                                                                               |                                                                                   |                                                                                   | 773                                                                                 |                                                                                     |                                                                                     |
| Approach Delay, s/veh          | 21.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 22.8                                                                              | 9.7                                                                               |                                                                                   |                                                                                   | 13.7                                                                                |                                                                                     |                                                                                     |
| Approach LOS                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   | C                                                                                 | A                                                                                 |                                                                                   |                                                                                   | B                                                                                   |                                                                                     |                                                                                     |
| Timer                          | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                   | 1                                                                                 | 2                                                                                 |                                                                                   |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s       | 5.6                                                                               | 35.9                                                                              |                                                                                   |                                                                                   | 12.6                                                                              | 9.7                                                                               | 31.9                                                                              | 12.6                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s        | 5.0                                                                               | 6.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 5.0                                                                               | 6.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s    | 15.0                                                                              | 51.0                                                                              |                                                                                   |                                                                                   | 25.0                                                                              | 15.0                                                                              | 51.0                                                                              | 25.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+12.3), s | 12.3                                                                              | 16.1                                                                              |                                                                                   |                                                                                   | 4.5                                                                               | 4.6                                                                               | 20.2                                                                              | 6.6                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s        | 0.0                                                                               | 5.2                                                                               |                                                                                   |                                                                                   | 0.4                                                                               | 0.3                                                                               | 5.7                                                                               | 0.2                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay            |                                                                                   |                                                                                   | 12.5                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 3: Honoapiilani Highway & Akahele Street

10/05/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |   |  |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                                | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)        | 45                                                                                | 75                                                                                | 85                                                                                | 215                                                                               | 80                                                                                | 95                                                                                | 85                                                                                | 710                                                                               | 185                                                                                | 165                                                                                 | 760                                                                                 | 50                                                                                  |
| Future Volume (veh/h)         | 45                                                                                | 75                                                                                | 85                                                                                | 215                                                                               | 80                                                                                | 95                                                                                | 85                                                                                | 710                                                                               | 185                                                                                | 165                                                                                 | 760                                                                                 | 50                                                                                  |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                 | 2                                                                                 | 12                                                                                 | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                               | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 49                                                                                | 82                                                                                | 63                                                                                | 234                                                                               | 87                                                                                | 15                                                                                | 92                                                                                | 772                                                                               | 143                                                                                | 179                                                                                 | 826                                                                                 | 25                                                                                  |
| Adj No. of Lanes              | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                  | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 64                                                                                | 104                                                                               | 80                                                                                | 263                                                                               | 408                                                                               | 347                                                                               | 118                                                                               | 845                                                                               | 718                                                                                | 211                                                                                 | 943                                                                                 | 800                                                                                 |
| Arrive On Green               | 0.04                                                                              | 0.11                                                                              | 0.11                                                                              | 0.15                                                                              | 0.22                                                                              | 0.22                                                                              | 0.07                                                                              | 0.45                                                                              | 0.45                                                                               | 0.12                                                                                | 0.51                                                                                | 0.51                                                                                |
| Sat Flow, veh/h               | 1774                                                                              | 972                                                                               | 747                                                                               | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                               | 1774                                                                                | 1863                                                                                | 1582                                                                                |
| Grp Volume(v), veh/h          | 49                                                                                | 0                                                                                 | 145                                                                               | 234                                                                               | 87                                                                                | 15                                                                                | 92                                                                                | 772                                                                               | 143                                                                                | 179                                                                                 | 826                                                                                 | 25                                                                                  |
| Grp Sat Flow(s),veh/h/ln      | 1774                                                                              | 0                                                                                 | 1718                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                              | 1774                                                                              | 1863                                                                              | 1583                                                                               | 1774                                                                                | 1863                                                                                | 1582                                                                                |
| Q Serve(g_s), s               | 3.2                                                                               | 0.0                                                                               | 9.5                                                                               | 15.0                                                                              | 4.4                                                                               | 0.9                                                                               | 5.9                                                                               | 44.8                                                                              | 6.3                                                                                | 11.4                                                                                | 45.5                                                                                | 0.9                                                                                 |
| Cycle Q Clear(g_c), s         | 3.2                                                                               | 0.0                                                                               | 9.5                                                                               | 15.0                                                                              | 4.4                                                                               | 0.9                                                                               | 5.9                                                                               | 44.8                                                                              | 6.3                                                                                | 11.4                                                                                | 45.5                                                                                | 0.9                                                                                 |
| Prop In Lane                  | 1.00                                                                              |                                                                                   | 0.43                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                               | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 64                                                                                | 0                                                                                 | 183                                                                               | 263                                                                               | 408                                                                               | 347                                                                               | 118                                                                               | 845                                                                               | 718                                                                                | 211                                                                                 | 943                                                                                 | 800                                                                                 |
| V/C Ratio(X)                  | 0.77                                                                              | 0.00                                                                              | 0.79                                                                              | 0.89                                                                              | 0.21                                                                              | 0.04                                                                              | 0.78                                                                              | 0.91                                                                              | 0.20                                                                               | 0.85                                                                                | 0.88                                                                                | 0.03                                                                                |
| Avail Cap(c_a), veh/h         | 307                                                                               | 0                                                                                 | 312                                                                               | 307                                                                               | 408                                                                               | 347                                                                               | 383                                                                               | 1047                                                                              | 890                                                                                | 383                                                                                 | 1047                                                                                | 889                                                                                 |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 55.3                                                                              | 0.0                                                                               | 50.4                                                                              | 48.3                                                                              | 37.0                                                                              | 35.6                                                                              | 53.2                                                                              | 29.5                                                                              | 19.0                                                                               | 50.0                                                                                | 25.4                                                                                | 14.3                                                                                |
| Incr Delay (d2), s/veh        | 17.5                                                                              | 0.0                                                                               | 7.5                                                                               | 23.5                                                                              | 0.3                                                                               | 0.1                                                                               | 10.7                                                                              | 10.5                                                                              | 0.1                                                                                | 9.2                                                                                 | 7.9                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 1.9                                                                               | 0.0                                                                               | 4.9                                                                               | 9.1                                                                               | 2.3                                                                               | 0.4                                                                               | 3.2                                                                               | 25.4                                                                              | 2.8                                                                                | 6.2                                                                                 | 25.3                                                                                | 0.4                                                                                 |
| LnGrp Delay(d),s/veh          | 72.8                                                                              | 0.0                                                                               | 57.9                                                                              | 71.8                                                                              | 37.3                                                                              | 35.7                                                                              | 63.9                                                                              | 40.0                                                                              | 19.1                                                                               | 59.1                                                                                | 33.3                                                                                | 14.4                                                                                |
| LnGrp LOS                     | E                                                                                 |                                                                                   | E                                                                                 | E                                                                                 | D                                                                                 | D                                                                                 | E                                                                                 | D                                                                                 | B                                                                                  | E                                                                                   | C                                                                                   | B                                                                                   |
| Approach Vol, veh/h           | 194                                                                               |                                                                                   |                                                                                   |                                                                                   | 336                                                                               |                                                                                   | 1007                                                                              |                                                                                   |                                                                                    |                                                                                     | 1030                                                                                |                                                                                     |
| Approach Delay, s/veh         | 61.7                                                                              |                                                                                   |                                                                                   |                                                                                   | 61.2                                                                              |                                                                                   | 39.2                                                                              |                                                                                   |                                                                                    |                                                                                     | 37.3                                                                                |                                                                                     |
| Approach LOS                  | E                                                                                 |                                                                                   |                                                                                   |                                                                                   | E                                                                                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                    |                                                                                     | D                                                                                   |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 18.7                                                                              | 57.5                                                                              | 22.2                                                                              | 17.3                                                                              | 12.7                                                                              | 63.5                                                                              | 9.2                                                                               | 30.3                                                                              |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              | 25.0                                                                              | 65.0                                                                              | 20.0                                                                              | 21.0                                                                              |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.4), s | 13.4                                                                              | 46.8                                                                              | 17.0                                                                              | 11.5                                                                              | 7.9                                                                               | 47.5                                                                              | 5.2                                                                               | 6.4                                                                               |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.3                                                                               | 5.7                                                                               | 0.2                                                                               | 0.5                                                                               | 0.2                                                                               | 5.7                                                                               | 0.1                                                                               | 0.3                                                                               |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           |                                                                                   |                                                                                   | 43.0                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 4: Honoapiilani Highway & Lower Honoapiilani Road

10/05/2017

|                             |                                                                                    |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
|-----------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                             |  |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Movement                    | EBL                                                                                | EBT                                                                               | EBR                                                                               | WBL  | WBT                                                                               | WBR  | NBL                                                                               | NBT                                                                               | NBR  | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations         |                                                                                    |  |  |      |  |      |  |  |      |  |  |  |
| Traffic Volume (veh/h)      | 80                                                                                 | 10                                                                                | 595                                                                               | 10   | 0                                                                                 | 5    | 410                                                                               | 930                                                                               | 5    | 0                                                                                   | 1035                                                                                | 70                                                                                  |
| Future Volume (veh/h)       | 80                                                                                 | 10                                                                                | 595                                                                               | 10   | 0                                                                                 | 5    | 410                                                                               | 930                                                                               | 5    | 0                                                                                   | 1035                                                                                | 70                                                                                  |
| Number                      | 3                                                                                  | 8                                                                                 | 18                                                                                | 7    | 4                                                                                 | 14   | 1                                                                                 | 6                                                                                 | 16   | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh         | 0                                                                                  | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)         | 1.00                                                                               |                                                                                   | 1.00                                                                              | 1.00 |                                                                                   | 1.00 | 1.00                                                                              |                                                                                   | 1.00 | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj            | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln      | 1900                                                                               | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h        | 87                                                                                 | 11                                                                                | 0                                                                                 | 11   | 0                                                                                 | 1    | 446                                                                               | 1011                                                                              | 5    | 0                                                                                   | 1125                                                                                | 40                                                                                  |
| Adj No. of Lanes            | 0                                                                                  | 1                                                                                 | 1                                                                                 | 0    | 1                                                                                 | 0    | 1                                                                                 | 2                                                                                 | 0    | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor            | 0.92                                                                               | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %        | 2                                                                                  | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                  | 192                                                                                | 14                                                                                | 134                                                                               | 206  | 3                                                                                 | 12   | 495                                                                               | 2828                                                                              | 14   | 2                                                                                   | 1614                                                                                | 720                                                                                 |
| Arrive On Green             | 0.10                                                                               | 0.08                                                                              | 0.00                                                                              | 0.10 | 0.00                                                                              | 0.08 | 0.28                                                                              | 0.78                                                                              | 0.78 | 0.00                                                                                | 0.46                                                                                | 0.46                                                                                |
| Sat Flow, veh/h             | 1303                                                                               | 165                                                                               | 1583                                                                              | 1457 | 38                                                                                | 136  | 1774                                                                              | 3611                                                                              | 18   | 1774                                                                                | 3539                                                                                | 1578                                                                                |
| Grp Volume(v), veh/h        | 98                                                                                 | 0                                                                                 | 0                                                                                 | 12   | 0                                                                                 | 0    | 446                                                                               | 495                                                                               | 521  | 0                                                                                   | 1125                                                                                | 40                                                                                  |
| Grp Sat Flow(s),veh/h/ln    | 1467                                                                               | 0                                                                                 | 1583                                                                              | 1631 | 0                                                                                 | 0    | 1774                                                                              | 1770                                                                              | 1860 | 1774                                                                                | 1770                                                                                | 1578                                                                                |
| Q Serve(g_s), s             | 4.8                                                                                | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0  | 20.1                                                                              | 7.0                                                                               | 7.0  | 0.0                                                                                 | 21.1                                                                                | 1.2                                                                                 |
| Cycle Q Clear(g_c), s       | 5.3                                                                                | 0.0                                                                               | 0.0                                                                               | 0.5  | 0.0                                                                               | 0.0  | 20.1                                                                              | 7.0                                                                               | 7.0  | 0.0                                                                                 | 21.1                                                                                | 1.2                                                                                 |
| Prop In Lane                | 0.89                                                                               |                                                                                   | 1.00                                                                              | 0.92 |                                                                                   | 0.08 | 1.00                                                                              |                                                                                   | 0.01 | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h      | 224                                                                                | 0                                                                                 | 134                                                                               | 241  | 0                                                                                 | 0    | 495                                                                               | 1386                                                                              | 1456 | 2                                                                                   | 1614                                                                                | 720                                                                                 |
| V/C Ratio(X)                | 0.44                                                                               | 0.00                                                                              | 0.00                                                                              | 0.05 | 0.00                                                                              | 0.00 | 0.90                                                                              | 0.36                                                                              | 0.36 | 0.00                                                                                | 0.70                                                                                | 0.06                                                                                |
| Avail Cap(c_a), veh/h       | 623                                                                                | 0                                                                                 | 572                                                                               | 580  | 0                                                                                 | 0    | 1516                                                                              | 1386                                                                              | 1456 | 1516                                                                                | 2428                                                                                | 1083                                                                                |
| HCM Platoon Ratio           | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)          | 1.00                                                                               | 0.00                                                                              | 0.00                                                                              | 1.00 | 0.00                                                                              | 0.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 0.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh    | 36.8                                                                               | 0.0                                                                               | 0.0                                                                               | 34.6 | 0.0                                                                               | 0.0  | 28.9                                                                              | 2.7                                                                               | 2.7  | 0.0                                                                                 | 18.0                                                                                | 12.6                                                                                |
| Incr Delay (d2), s/veh      | 1.3                                                                                | 0.0                                                                               | 0.0                                                                               | 0.1  | 0.0                                                                               | 0.0  | 2.5                                                                               | 0.3                                                                               | 0.3  | 0.0                                                                                 | 1.2                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh   | 0.0                                                                                | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln    | 2.2                                                                                | 0.0                                                                               | 0.0                                                                               | 0.3  | 0.0                                                                               | 0.0  | 10.1                                                                              | 3.4                                                                               | 3.6  | 0.0                                                                                 | 10.4                                                                                | 0.5                                                                                 |
| LnGrp Delay(d),s/veh        | 38.1                                                                               | 0.0                                                                               | 0.0                                                                               | 34.7 | 0.0                                                                               | 0.0  | 31.4                                                                              | 3.1                                                                               | 3.0  | 0.0                                                                                 | 19.2                                                                                | 12.7                                                                                |
| LnGrp LOS                   | D                                                                                  |                                                                                   |                                                                                   | C    |                                                                                   |      | C                                                                                 | A                                                                                 | A    |                                                                                     | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h         | 98                                                                                 |                                                                                   |                                                                                   | 12   |                                                                                   |      | 1462                                                                              |                                                                                   |      | 1165                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh       | 38.1                                                                               |                                                                                   |                                                                                   | 34.7 |                                                                                   |      | 11.7                                                                              |                                                                                   |      | 19.0                                                                                |                                                                                     |                                                                                     |
| Approach LOS                | D                                                                                  |                                                                                   |                                                                                   | C    |                                                                                   |      | B                                                                                 |                                                                                   |      | B                                                                                   |                                                                                     |                                                                                     |
| Timer                       | 1                                                                                  | 2                                                                                 | 3                                                                                 | 4    | 5                                                                                 | 6    | 7                                                                                 | 8                                                                                 |      |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                | 1                                                                                  | 2                                                                                 |                                                                                   | 4    | 5                                                                                 | 6    |                                                                                   | 8                                                                                 |      |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s    | 27.2                                                                               | 43.9                                                                              |                                                                                   | 12.0 | 0.0                                                                               | 71.1 |                                                                                   | 12.0                                                                              |      |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s     | 4.0                                                                                | 6.0                                                                               |                                                                                   | 5.0  | 4.0                                                                               | 6.0  |                                                                                   | 5.0                                                                               |      |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s | 1.0                                                                                | 57.0                                                                              |                                                                                   | 27.0 | 71.0                                                                              | 57.0 |                                                                                   | 30.0                                                                              |      |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+Q), s | 23.1                                                                               | 23.1                                                                              |                                                                                   | 2.5  | 0.0                                                                               | 9.0  |                                                                                   | 7.3                                                                               |      |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s     | 1.0                                                                                | 14.8                                                                              |                                                                                   | 0.0  | 0.0                                                                               | 12.7 |                                                                                   | 0.3                                                                               |      |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary        |                                                                                    |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay         | 15.8                                                                               |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                | B                                                                                  |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 5: Honoapiilani Highway & Halawai Drive

10/05/2017

|                              |  |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
|------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                     | EBL                                                                                | EBT                                                                               | EBR                                                                               | WBL  | WBT                                                                               | WBR  | NBL                                                                               | NBT                                                                               | NBR  | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                    |  |  |      |  |      |  |  |      |  |  |  |
| Traffic Volume (veh/h)       | 65                                                                                 | 5                                                                                 | 145                                                                               | 15   | 5                                                                                 | 15   | 105                                                                               | 1275                                                                              | 20   | 10                                                                                  | 1600                                                                                | 70                                                                                  |
| Future Volume (veh/h)        | 65                                                                                 | 5                                                                                 | 145                                                                               | 15   | 5                                                                                 | 15   | 105                                                                               | 1275                                                                              | 20   | 10                                                                                  | 1600                                                                                | 70                                                                                  |
| Number                       | 3                                                                                  | 8                                                                                 | 18                                                                                | 7    | 4                                                                                 | 14   | 1                                                                                 | 6                                                                                 | 16   | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                  | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 0.98                                                                               |                                                                                   | 0.98                                                                              | 0.98 |                                                                                   | 0.98 | 1.00                                                                              |                                                                                   | 1.00 | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                               | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                              | 1900 | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 71                                                                                 | 5                                                                                 | 5                                                                                 | 16   | 5                                                                                 | 1    | 114                                                                               | 1386                                                                              | 22   | 11                                                                                  | 1739                                                                                | 48                                                                                  |
| Adj No. of Lanes             | 0                                                                                  | 1                                                                                 | 1                                                                                 | 0    | 1                                                                                 | 0    | 1                                                                                 | 2                                                                                 | 0    | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                               | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                  | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 207                                                                                | 12                                                                                | 141                                                                               | 128  | 31                                                                                | 4    | 144                                                                               | 2661                                                                              | 42   | 14                                                                                  | 2383                                                                                | 1064                                                                                |
| Arrive On Green              | 0.10                                                                               | 0.09                                                                              | 0.09                                                                              | 0.10 | 0.09                                                                              | 0.09 | 0.08                                                                              | 0.75                                                                              | 0.75 | 0.01                                                                                | 0.67                                                                                | 0.67                                                                                |
| Sat Flow, veh/h              | 1429                                                                               | 129                                                                               | 1547                                                                              | 646  | 344                                                                               | 47   | 1774                                                                              | 3566                                                                              | 57   | 1774                                                                                | 3539                                                                                | 1580                                                                                |
| Grp Volume(v), veh/h         | 76                                                                                 | 0                                                                                 | 5                                                                                 | 22   | 0                                                                                 | 0    | 114                                                                               | 687                                                                               | 721  | 11                                                                                  | 1739                                                                                | 48                                                                                  |
| Grp Sat Flow(s),veh/h/ln     | 1558                                                                               | 0                                                                                 | 1547                                                                              | 1037 | 0                                                                                 | 0    | 1774                                                                              | 1770                                                                              | 1853 | 1774                                                                                | 1770                                                                                | 1580                                                                                |
| Q Serve(g_s), s              | 0.0                                                                                | 0.0                                                                               | 0.3                                                                               | 0.3  | 0.0                                                                               | 0.0  | 5.7                                                                               | 14.6                                                                              | 14.6 | 0.6                                                                                 | 28.6                                                                                | 0.9                                                                                 |
| Cycle Q Clear(g_c), s        | 3.7                                                                                | 0.0                                                                               | 0.3                                                                               | 4.0  | 0.0                                                                               | 0.0  | 5.7                                                                               | 14.6                                                                              | 14.6 | 0.6                                                                                 | 28.6                                                                                | 0.9                                                                                 |
| Prop In Lane                 | 0.93                                                                               |                                                                                   | 1.00                                                                              | 0.73 |                                                                                   | 0.05 | 1.00                                                                              |                                                                                   | 0.03 | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 236                                                                                | 0                                                                                 | 141                                                                               | 175  | 0                                                                                 | 0    | 144                                                                               | 1321                                                                              | 1383 | 14                                                                                  | 2383                                                                                | 1064                                                                                |
| V/C Ratio(X)                 | 0.32                                                                               | 0.00                                                                              | 0.04                                                                              | 0.13 | 0.00                                                                              | 0.00 | 0.79                                                                              | 0.52                                                                              | 0.52 | 0.77                                                                                | 0.73                                                                                | 0.05                                                                                |
| Avail Cap(c_a), veh/h        | 464                                                                                | 0                                                                                 | 392                                                                               | 413  | 0                                                                                 | 0    | 411                                                                               | 1677                                                                              | 1756 | 215                                                                                 | 2965                                                                                | 1323                                                                                |
| HCM Platoon Ratio            | 1.00                                                                               | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                               | 0.00                                                                              | 1.00                                                                              | 1.00 | 0.00                                                                              | 0.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 38.7                                                                               | 0.0                                                                               | 37.6                                                                              | 38.3 | 0.0                                                                               | 0.0  | 40.9                                                                              | 4.8                                                                               | 4.8  | 44.9                                                                                | 9.5                                                                                 | 5.0                                                                                 |
| Incr Delay (d2), s/veh       | 0.3                                                                                | 0.0                                                                               | 0.0                                                                               | 0.1  | 0.0                                                                               | 0.0  | 3.7                                                                               | 0.7                                                                               | 0.7  | 27.4                                                                                | 1.1                                                                                 | 0.0                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                                | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 1.8                                                                                | 0.0                                                                               | 0.1                                                                               | 0.5  | 0.0                                                                               | 0.0  | 3.0                                                                               | 7.3                                                                               | 7.7  | 0.4                                                                                 | 14.1                                                                                | 0.4                                                                                 |
| LnGrp Delay(d),s/veh         | 39.0                                                                               | 0.0                                                                               | 37.6                                                                              | 38.4 | 0.0                                                                               | 0.0  | 44.6                                                                              | 5.5                                                                               | 5.4  | 72.3                                                                                | 10.6                                                                                | 5.0                                                                                 |
| LnGrp LOS                    | D                                                                                  |                                                                                   | D                                                                                 | D    |                                                                                   |      | D                                                                                 | A                                                                                 | A    | E                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 81                                                                                 |                                                                                   |                                                                                   |      |                                                                                   | 22   |                                                                                   | 1522                                                                              |      | 1798                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 38.9                                                                               |                                                                                   |                                                                                   |      |                                                                                   | 38.4 |                                                                                   | 8.4                                                                               |      | 10.9                                                                                |                                                                                     |                                                                                     |
| Approach LOS                 | D                                                                                  |                                                                                   |                                                                                   |      |                                                                                   | D    |                                                                                   | A                                                                                 |      | B                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                  | 2                                                                                 | 3                                                                                 | 4    | 5                                                                                 | 6    | 7                                                                                 | 8                                                                                 |      |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                  | 2                                                                                 | 4                                                                                 |      | 5                                                                                 | 6    | 8                                                                                 |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 11.4                                                                               | 66.1                                                                              | 13.3                                                                              |      | 4.7                                                                               | 72.7 | 13.3                                                                              |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                                | 5.0                                                                               | 5.0                                                                               |      | 4.0                                                                               | 5.0  | 5.0                                                                               |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 21.0                                                                               | 76.0                                                                              | 23.0                                                                              |      | 11.0                                                                              | 86.0 | 23.0                                                                              |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+17, s) | 17.5                                                                               | 30.6                                                                              | 6.0                                                                               |      | 2.6                                                                               | 16.6 | 5.7                                                                               |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.1                                                                                | 30.4                                                                              | 0.0                                                                               |      | 0.0                                                                               | 24.6 | 0.1                                                                               |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                    |                                                                                   |                                                                                   |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                    |                                                                                   | 10.6                                                                              |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                    |                                                                                   | B                                                                                 |      |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 6: Honoapiilani Highway & Kai Ala Drive/Puukolii Road

10/05/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |  |   |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                   |  |  |  |  |                                                                                   |  |  |  |  |  |  |
| Traffic Volume (veh/h)        | 75                                                                                | 5                                                                                 | 180                                                                               | 45                                                                                | 5                                                                                 | 40                                                                                | 110                                                                               | 1345                                                                              | 50                                                                                | 35                                                                                  | 1665                                                                                | 85                                                                                  |
| Future Volume (veh/h)         | 75                                                                                | 5                                                                                 | 180                                                                               | 45                                                                                | 5                                                                                 | 40                                                                                | 110                                                                               | 1345                                                                              | 50                                                                                | 35                                                                                  | 1665                                                                                | 85                                                                                  |
| Number                        | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 82                                                                                | 5                                                                                 | 11                                                                                | 49                                                                                | 5                                                                                 | 3                                                                                 | 120                                                                               | 1462                                                                              | 34                                                                                | 38                                                                                  | 1810                                                                                | 54                                                                                  |
| Adj No. of Lanes              | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 1                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 252                                                                               | 13                                                                                | 213                                                                               | 185                                                                               | 147                                                                               | 88                                                                                | 152                                                                               | 2361                                                                              | 1056                                                                              | 60                                                                                  | 2178                                                                                | 974                                                                                 |
| Arrive On Green               | 0.15                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.09                                                                              | 0.67                                                                              | 0.67                                                                              | 0.03                                                                                | 0.62                                                                                | 0.62                                                                                |
| Sat Flow, veh/h               | 1299                                                                              | 96                                                                                | 1576                                                                              | 1387                                                                              | 1090                                                                              | 654                                                                               | 1774                                                                              | 3539                                                                              | 1583                                                                              | 1774                                                                                | 3539                                                                                | 1583                                                                                |
| Grp Volume(v), veh/h          | 87                                                                                | 0                                                                                 | 11                                                                                | 49                                                                                | 0                                                                                 | 8                                                                                 | 120                                                                               | 1462                                                                              | 34                                                                                | 38                                                                                  | 1810                                                                                | 54                                                                                  |
| Grp Sat Flow(s),veh/h/ln      | 1395                                                                              | 0                                                                                 | 1576                                                                              | 1387                                                                              | 0                                                                                 | 1744                                                                              | 1774                                                                              | 1770                                                                              | 1583                                                                              | 1774                                                                                | 1770                                                                                | 1583                                                                                |
| Q Serve(g_s), s               | 5.0                                                                               | 0.0                                                                               | 0.6                                                                               | 3.1                                                                               | 0.0                                                                               | 0.4                                                                               | 6.1                                                                               | 21.5                                                                              | 0.7                                                                               | 1.9                                                                                 | 36.9                                                                                | 1.2                                                                                 |
| Cycle Q Clear(g_c), s         | 5.3                                                                               | 0.0                                                                               | 0.6                                                                               | 8.4                                                                               | 0.0                                                                               | 0.4                                                                               | 6.1                                                                               | 21.5                                                                              | 0.7                                                                               | 1.9                                                                                 | 36.9                                                                                | 1.2                                                                                 |
| Prop In Lane                  | 0.94                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.38                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 280                                                                               | 0                                                                                 | 213                                                                               | 185                                                                               | 0                                                                                 | 236                                                                               | 152                                                                               | 2361                                                                              | 1056                                                                              | 60                                                                                  | 2178                                                                                | 974                                                                                 |
| V/C Ratio(X)                  | 0.31                                                                              | 0.00                                                                              | 0.05                                                                              | 0.26                                                                              | 0.00                                                                              | 0.03                                                                              | 0.79                                                                              | 0.62                                                                              | 0.03                                                                              | 0.63                                                                                | 0.83                                                                                | 0.06                                                                                |
| Avail Cap(c_a), veh/h         | 460                                                                               | 0                                                                                 | 413                                                                               | 361                                                                               | 0                                                                                 | 457                                                                               | 407                                                                               | 2666                                                                              | 1193                                                                              | 232                                                                                 | 2318                                                                                | 1037                                                                                |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh      | 36.2                                                                              | 0.0                                                                               | 34.5                                                                              | 40.5                                                                              | 0.0                                                                               | 34.4                                                                              | 41.1                                                                              | 8.6                                                                               | 5.2                                                                               | 43.7                                                                                | 13.9                                                                                | 7.0                                                                                 |
| Incr Delay (d2), s/veh        | 0.6                                                                               | 0.0                                                                               | 0.1                                                                               | 0.8                                                                               | 0.0                                                                               | 0.1                                                                               | 3.4                                                                               | 0.6                                                                               | 0.0                                                                               | 4.1                                                                                 | 3.0                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 2.0                                                                               | 0.0                                                                               | 0.2                                                                               | 1.2                                                                               | 0.0                                                                               | 0.2                                                                               | 3.1                                                                               | 10.6                                                                              | 0.3                                                                               | 1.0                                                                                 | 18.8                                                                                | 0.6                                                                                 |
| LnGrp Delay(d),s/veh          | 36.8                                                                              | 0.0                                                                               | 34.6                                                                              | 41.2                                                                              | 0.0                                                                               | 34.5                                                                              | 44.5                                                                              | 9.3                                                                               | 5.2                                                                               | 47.7                                                                                | 16.9                                                                                | 7.1                                                                                 |
| LnGrp LOS                     | D                                                                                 |                                                                                   | C                                                                                 | D                                                                                 |                                                                                   | C                                                                                 | D                                                                                 | A                                                                                 | A                                                                                 | D                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h           |                                                                                   | 98                                                                                |                                                                                   |                                                                                   | 57                                                                                |                                                                                   |                                                                                   | 1616                                                                              |                                                                                   |                                                                                     | 1902                                                                                |                                                                                     |
| Approach Delay, s/veh         |                                                                                   | 36.6                                                                              |                                                                                   |                                                                                   | 40.3                                                                              |                                                                                   |                                                                                   | 11.8                                                                              |                                                                                   |                                                                                     | 17.2                                                                                |                                                                                     |
| Approach LOS                  |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                   | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 11.9                                                                              | 62.4                                                                              |                                                                                   | 17.4                                                                              | 7.1                                                                               | 67.1                                                                              |                                                                                   | 17.4                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               | 4.0                                                                               | 6.0                                                                               |                                                                                   | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 21.0                                                                              | 60.0                                                                              |                                                                                   | 24.0                                                                              | 12.0                                                                              | 69.0                                                                              |                                                                                   | 24.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.0), s | 19.1                                                                              | 38.9                                                                              |                                                                                   | 10.4                                                                              | 3.9                                                                               | 23.5                                                                              |                                                                                   | 7.3                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.2                                                                               | 17.5                                                                              |                                                                                   | 0.1                                                                               | 0.0                                                                               | 24.1                                                                              |                                                                                   | 0.3                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           | 15.7                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 7: Honoapiilani Highway & Kaanapali Parkway/Halelo Street

10/05/2017

|                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                              |  |  |  |  |  |  |  |  |  |   |  |  |
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |  |  |  |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |  |
| Traffic Volume (veh/h)       | 350                                                                               | 5                                                                                 | 585                                                                               | 15                                                                                | 5                                                                                 | 20                                                                                | 445                                                                               | 1355                                                                              | 15                                                                                | 60                                                                                  | 1555                                                                                | 245                                                                                 |
| Future Volume (veh/h)        | 350                                                                               | 5                                                                                 | 585                                                                               | 15                                                                                | 5                                                                                 | 20                                                                                | 445                                                                               | 1355                                                                              | 15                                                                                | 60                                                                                  | 1555                                                                                | 245                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h         | 384                                                                               | 0                                                                                 | 436                                                                               | 16                                                                                | 5                                                                                 | 7                                                                                 | 484                                                                               | 1473                                                                              | 16                                                                                | 65                                                                                  | 1690                                                                                | 221                                                                                 |
| Adj No. of Lanes             | 2                                                                                 | 0                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 2                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 521                                                                               | 0                                                                                 | 970                                                                               | 36                                                                                | 11                                                                                | 16                                                                                | 567                                                                               | 2426                                                                              | 26                                                                                | 101                                                                                 | 2013                                                                                | 1124                                                                                |
| Arrive On Green              | 0.15                                                                              | 0.00                                                                              | 0.14                                                                              | 0.04                                                                              | 0.04                                                                              | 0.02                                                                              | 0.16                                                                              | 0.68                                                                              | 0.67                                                                              | 0.06                                                                                | 0.57                                                                                | 0.57                                                                                |
| Sat Flow, veh/h              | 3548                                                                              | 0                                                                                 | 3167                                                                              | 992                                                                               | 310                                                                               | 434                                                                               | 3442                                                                              | 3587                                                                              | 39                                                                                | 1774                                                                                | 3539                                                                                | 1582                                                                                |
| Grp Volume(v), veh/h         | 384                                                                               | 0                                                                                 | 436                                                                               | 28                                                                                | 0                                                                                 | 0                                                                                 | 484                                                                               | 726                                                                               | 763                                                                               | 65                                                                                  | 1690                                                                                | 221                                                                                 |
| Grp Sat Flow(s),veh/h/ln     | 1774                                                                              | 0                                                                                 | 1583                                                                              | 1737                                                                              | 0                                                                                 | 0                                                                                 | 1721                                                                              | 1770                                                                              | 1856                                                                              | 1774                                                                                | 1770                                                                                | 1582                                                                                |
| Q Serve(g_s), s              | 19.8                                                                              | 0.0                                                                               | 21.2                                                                              | 3.0                                                                               | 0.0                                                                               | 0.0                                                                               | 26.1                                                                              | 43.1                                                                              | 43.2                                                                              | 6.9                                                                                 | 75.3                                                                                | 9.0                                                                                 |
| Cycle Q Clear(g_c), s        | 19.8                                                                              | 0.0                                                                               | 21.2                                                                              | 3.0                                                                               | 0.0                                                                               | 0.0                                                                               | 26.1                                                                              | 43.1                                                                              | 43.2                                                                              | 6.9                                                                                 | 75.3                                                                                | 9.0                                                                                 |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.57                                                                              |                                                                                   | 0.25                                                                              | 1.00                                                                              |                                                                                   | 0.02                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h       | 521                                                                               | 0                                                                                 | 970                                                                               | 63                                                                                | 0                                                                                 | 0                                                                                 | 567                                                                               | 1197                                                                              | 1255                                                                              | 101                                                                                 | 2013                                                                                | 1124                                                                                |
| V/C Ratio(X)                 | 0.74                                                                              | 0.00                                                                              | 0.45                                                                              | 0.45                                                                              | 0.00                                                                              | 0.00                                                                              | 0.85                                                                              | 0.61                                                                              | 0.61                                                                              | 0.64                                                                                | 0.84                                                                                | 0.20                                                                                |
| Avail Cap(c_a), veh/h        | 631                                                                               | 0                                                                                 | 1068                                                                              | 282                                                                               | 0                                                                                 | 0                                                                                 | 1044                                                                              | 1796                                                                              | 1884                                                                              | 139                                                                                 | 2796                                                                                | 1474                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 78.0                                                                              | 0.0                                                                               | 53.3                                                                              | 90.6                                                                              | 0.0                                                                               | 0.0                                                                               | 77.6                                                                              | 17.0                                                                              | 17.0                                                                              | 88.2                                                                                | 34.0                                                                                | 9.3                                                                                 |
| Incr Delay (d2), s/veh       | 2.7                                                                               | 0.0                                                                               | 0.1                                                                               | 1.8                                                                               | 0.0                                                                               | 0.0                                                                               | 1.5                                                                               | 0.7                                                                               | 0.7                                                                               | 2.5                                                                                 | 2.1                                                                                 | 0.1                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 19.9                                                                              | 0.0                                                                               | 9.3                                                                               | 1.5                                                                               | 0.0                                                                               | 0.0                                                                               | 12.6                                                                              | 21.2                                                                              | 22.3                                                                              | 3.4                                                                                 | 37.2                                                                                | 5.9                                                                                 |
| LnGrp Delay(d),s/veh         | 80.7                                                                              | 0.0                                                                               | 53.5                                                                              | 92.4                                                                              | 0.0                                                                               | 0.0                                                                               | 79.1                                                                              | 17.7                                                                              | 17.7                                                                              | 90.8                                                                                | 36.1                                                                                | 9.4                                                                                 |
| LnGrp LOS                    | F                                                                                 |                                                                                   | D                                                                                 | F                                                                                 |                                                                                   |                                                                                   | E                                                                                 | B                                                                                 | B                                                                                 | F                                                                                   | D                                                                                   | A                                                                                   |
| Approach Vol, veh/h          | 820                                                                               |                                                                                   |                                                                                   |                                                                                   | 28                                                                                |                                                                                   |                                                                                   |                                                                                   | 1973                                                                              |                                                                                     | 1976                                                                                |                                                                                     |
| Approach Delay, s/veh        | 66.2                                                                              |                                                                                   |                                                                                   |                                                                                   | 92.4                                                                              |                                                                                   |                                                                                   |                                                                                   | 32.7                                                                              |                                                                                     | 34.9                                                                                |                                                                                     |
| Approach LOS                 | E                                                                                 |                                                                                   |                                                                                   |                                                                                   | F                                                                                 |                                                                                   |                                                                                   |                                                                                   | C                                                                                 |                                                                                     | C                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 35.5                                                                              | 112.7                                                                             |                                                                                   |                                                                                   | 10.9                                                                              | 14.9                                                                              | 133.3                                                                             | 32.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 6.0                                                                               | 6.0                                                                               |                                                                                   |                                                                                   | 7.0                                                                               | 6.0                                                                               | 6.0                                                                               | 7.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 50.0                                                                              | 149.0                                                                             |                                                                                   |                                                                                   | 28.0                                                                              | 13.0                                                                              | 192.0                                                                             | 31.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+20), s | 29.1                                                                              | 77.3                                                                              |                                                                                   |                                                                                   | 5.0                                                                               | 8.9                                                                               | 45.2                                                                              | 23.2                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 1.3                                                                               | 29.3                                                                              |                                                                                   |                                                                                   | 0.0                                                                               | 0.0                                                                               | 17.7                                                                              | 1.9                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 39.7                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |



# HCM 2010 Signalized Intersection Summary

## 8: Honoapiilani Highway & Leialii Parkway

10/05/2017

|                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                              |  |  |  |  |  |  |  |  |  |   |  |  |
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |                                                                                   |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |
| Traffic Volume (veh/h)       | 5                                                                                 | 0                                                                                 | 5                                                                                 | 135                                                                               | 5                                                                                 | 70                                                                                | 5                                                                                 | 1690                                                                              | 90                                                                                | 95                                                                                  | 2130                                                                                | 10                                                                                  |
| Future Volume (veh/h)        | 5                                                                                 | 0                                                                                 | 5                                                                                 | 135                                                                               | 5                                                                                 | 70                                                                                | 5                                                                                 | 1690                                                                              | 90                                                                                | 95                                                                                  | 2130                                                                                | 10                                                                                  |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 5                                                                                 | 0                                                                                 | 1                                                                                 | 147                                                                               | 5                                                                                 | 5                                                                                 | 5                                                                                 | 1837                                                                              | 95                                                                                | 103                                                                                 | 2315                                                                                | 11                                                                                  |
| Adj No. of Lanes             | 0                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 194                                                                               | 5                                                                                 | 30                                                                                | 234                                                                               | 107                                                                               | 107                                                                               | 11                                                                                | 2431                                                                              | 125                                                                               | 129                                                                                 | 2803                                                                                | 13                                                                                  |
| Arrive On Green              | 0.13                                                                              | 0.00                                                                              | 0.12                                                                              | 0.13                                                                              | 0.13                                                                              | 0.12                                                                              | 0.01                                                                              | 0.94                                                                              | 0.93                                                                              | 0.07                                                                                | 0.78                                                                                | 0.77                                                                                |
| Sat Flow, veh/h              | 1140                                                                              | 37                                                                                | 235                                                                               | 1410                                                                              | 856                                                                               | 856                                                                               | 1774                                                                              | 3426                                                                              | 176                                                                               | 1774                                                                                | 3612                                                                                | 17                                                                                  |
| Grp Volume(v), veh/h         | 6                                                                                 | 0                                                                                 | 0                                                                                 | 147                                                                               | 0                                                                                 | 10                                                                                | 5                                                                                 | 941                                                                               | 991                                                                               | 103                                                                                 | 1133                                                                                | 1193                                                                                |
| Grp Sat Flow(s),veh/h/ln     | 1412                                                                              | 0                                                                                 | 0                                                                                 | 1410                                                                              | 0                                                                                 | 1712                                                                              | 1774                                                                              | 1770                                                                              | 1832                                                                              | 1774                                                                                | 1770                                                                                | 1860                                                                                |
| Q Serve(g_s), s              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 12.4                                                                              | 0.0                                                                               | 0.7                                                                               | 0.4                                                                               | 13.3                                                                              | 14.3                                                                              | 7.4                                                                                 | 51.9                                                                                | 52.1                                                                                |
| Cycle Q Clear(g_c), s        | 0.7                                                                               | 0.0                                                                               | 0.0                                                                               | 13.0                                                                              | 0.0                                                                               | 0.7                                                                               | 0.4                                                                               | 13.3                                                                              | 14.3                                                                              | 7.4                                                                                 | 51.9                                                                                | 52.1                                                                                |
| Prop In Lane                 | 0.83                                                                              |                                                                                   | 0.17                                                                              | 1.00                                                                              |                                                                                   | 0.50                                                                              | 1.00                                                                              |                                                                                   | 0.10                                                                              | 1.00                                                                                |                                                                                     | 0.01                                                                                |
| Lane Grp Cap(c), veh/h       | 228                                                                               | 0                                                                                 | 0                                                                                 | 234                                                                               | 0                                                                                 | 215                                                                               | 11                                                                                | 1256                                                                              | 1300                                                                              | 129                                                                                 | 1373                                                                                | 1443                                                                                |
| V/C Ratio(X)                 | 0.03                                                                              | 0.00                                                                              | 0.00                                                                              | 0.63                                                                              | 0.00                                                                              | 0.05                                                                              | 0.44                                                                              | 0.75                                                                              | 0.76                                                                              | 0.80                                                                                | 0.83                                                                                | 0.83                                                                                |
| Avail Cap(c_a), veh/h        | 312                                                                               | 0                                                                                 | 0                                                                                 | 318                                                                               | 0                                                                                 | 316                                                                               | 150                                                                               | 1256                                                                              | 1300                                                                              | 150                                                                                 | 1373                                                                                | 1443                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.33                                                                              | 1.33                                                                              | 1.33                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.67                                                                              | 0.67                                                                              | 0.67                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Uniform Delay (d), s/veh     | 50.0                                                                              | 0.0                                                                               | 0.0                                                                               | 55.3                                                                              | 0.0                                                                               | 50.2                                                                              | 64.2                                                                              | 1.4                                                                               | 1.5                                                                               | 59.3                                                                                | 9.1                                                                                 | 9.1                                                                                 |
| Incr Delay (d2), s/veh       | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 2.8                                                                               | 0.0                                                                               | 0.1                                                                               | 6.7                                                                               | 2.8                                                                               | 2.9                                                                               | 19.3                                                                                | 5.8                                                                                 | 5.6                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 5.3                                                                               | 0.0                                                                               | 0.3                                                                               | 0.2                                                                               | 6.4                                                                               | 7.2                                                                               | 4.3                                                                                 | 27.1                                                                                | 28.4                                                                                |
| LnGrp Delay(d),s/veh         | 50.0                                                                              | 0.0                                                                               | 0.0                                                                               | 58.1                                                                              | 0.0                                                                               | 50.3                                                                              | 70.9                                                                              | 4.3                                                                               | 4.4                                                                               | 78.6                                                                                | 14.8                                                                                | 14.7                                                                                |
| LnGrp LOS                    | D                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   | D                                                                                 | E                                                                                 | A                                                                                 | A                                                                                 | E                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          | 6                                                                                 |                                                                                   |                                                                                   |                                                                                   | 157                                                                               |                                                                                   | 1937                                                                              |                                                                                   |                                                                                   |                                                                                     | 2429                                                                                |                                                                                     |
| Approach Delay, s/veh        | 50.0                                                                              |                                                                                   |                                                                                   |                                                                                   | 57.6                                                                              |                                                                                   | 4.5                                                                               |                                                                                   |                                                                                   |                                                                                     | 17.5                                                                                |                                                                                     |
| Approach LOS                 | D                                                                                 |                                                                                   |                                                                                   |                                                                                   | E                                                                                 |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 |                                                                                   |                                                                                   | 4                                                                                 | 5                                                                                 | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 4.8                                                                               | 104.9                                                                             |                                                                                   |                                                                                   | 20.3                                                                              | 13.5                                                                              | 96.2                                                                              | 20.3                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 11.0                                                                              | 82.0                                                                              |                                                                                   |                                                                                   | 23.0                                                                              | 11.0                                                                              | 82.0                                                                              | 23.0                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+12, s) | 12.4                                                                              | 54.1                                                                              |                                                                                   |                                                                                   | 15.0                                                                              | 9.4                                                                               | 16.3                                                                              | 2.7                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 26.0                                                                              |                                                                                   |                                                                                   | 0.3                                                                               | 0.0                                                                               | 44.1                                                                              | 0.0                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 13.4                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 9: Honoapiilani Highway & Front Street/Flemming Road

10/05/2017

|                               | <div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div> |                                                                                   |      |      |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|------|-----------------------------------------------------------------------------------|-------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                      | EBL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | EBT                                                                               | EBR  | WBL  | WBT                                                                               | WBR   | NBL                                                                               | NBT                                                                               | NBR  | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |      |      |  |       |  |  |      |  |  |  |
| Traffic Volume (veh/h)        | 150                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 5                                                                                 | 15   | 65   | 5                                                                                 | 15    | 15                                                                                | 1615                                                                              | 15   | 10                                                                                  | 1890                                                                                | 285                                                                                 |
| Future Volume (veh/h)         | 150                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 5                                                                                 | 15   | 65   | 5                                                                                 | 15    | 15                                                                                | 1615                                                                              | 15   | 10                                                                                  | 1890                                                                                | 285                                                                                 |
| Number                        | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 8                                                                                 | 18   | 7    | 4                                                                                 | 14    | 1                                                                                 | 6                                                                                 | 16   | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0                                                                                 | 0    | 0    | 0                                                                                 | 0     | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                   | 1.00 | 1.00 |                                                                                   | 1.00  | 1.00                                                                              |                                                                                   | 1.00 | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.00                                                                              | 1.00 | 1.00 | 1.00                                                                              | 1.00  | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1863                                                                              | 1900 | 1900 | 1863                                                                              | 1900  | 1863                                                                              | 1863                                                                              | 1900 | 1863                                                                                | 1863                                                                                | 1863                                                                                |
| Adj Flow Rate, veh/h          | 163                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 5                                                                                 | 14   | 71   | 5                                                                                 | 9     | 16                                                                                | 1755                                                                              | 16   | 11                                                                                  | 2054                                                                                | 238                                                                                 |
| Adj No. of Lanes              | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1                                                                                 | 0    | 0    | 1                                                                                 | 0     | 1                                                                                 | 2                                                                                 | 0    | 1                                                                                   | 2                                                                                   | 1                                                                                   |
| Peak Hour Factor              | 0.92                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.92                                                                              | 0.92 | 0.92 | 0.92                                                                              | 0.92  | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2                                                                                 | 2    | 2    | 2                                                                                 | 2     | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 244                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 6                                                                                 | 16   | 244  | 19                                                                                | 25    | 19                                                                                | 2720                                                                              | 25   | 13                                                                                  | 2668                                                                                | 1193                                                                                |
| Arrive On Green               | 0.14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.14                                                                              | 0.14 | 0.14 | 0.14                                                                              | 0.14  | 0.01                                                                              | 0.76                                                                              | 0.75 | 0.01                                                                                | 0.75                                                                                | 0.75                                                                                |
| Sat Flow, veh/h               | 1338                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 41                                                                                | 115  | 1347 | 129                                                                               | 175   | 1774                                                                              | 3594                                                                              | 33   | 1774                                                                                | 3539                                                                                | 1582                                                                                |
| Grp Volume(v), veh/h          | 182                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0                                                                                 | 0    | 85   | 0                                                                                 | 0     | 16                                                                                | 863                                                                               | 908  | 11                                                                                  | 2054                                                                                | 238                                                                                 |
| Grp Sat Flow(s),veh/h/ln      | 1494                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0                                                                                 | 0    | 1651 | 0                                                                                 | 0     | 1774                                                                              | 1770                                                                              | 1857 | 1774                                                                                | 1770                                                                                | 1582                                                                                |
| Q Serve(g_s), s               | 9.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.0                                                                               | 0.0  | 0.0  | 0.0                                                                               | 0.0   | 1.2                                                                               | 30.1                                                                              | 30.2 | 0.8                                                                                 | 44.3                                                                                | 5.7                                                                                 |
| Cycle Q Clear(g_c), s         | 15.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.0                                                                               | 0.0  | 5.8  | 0.0                                                                               | 0.0   | 1.2                                                                               | 30.1                                                                              | 30.2 | 0.8                                                                                 | 44.3                                                                                | 5.7                                                                                 |
| Prop In Lane                  | 0.90                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                   | 0.08 | 0.84 |                                                                                   | 0.11  | 1.00                                                                              |                                                                                   | 0.02 | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Lane Grp Cap(c), veh/h        | 267                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0                                                                                 | 0    | 287  | 0                                                                                 | 0     | 19                                                                                | 1339                                                                              | 1405 | 13                                                                                  | 2668                                                                                | 1193                                                                                |
| V/C Ratio(X)                  | 0.68                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.00                                                                              | 0.00 | 0.30 | 0.00                                                                              | 0.00  | 0.84                                                                              | 0.64                                                                              | 0.65 | 0.82                                                                                | 0.77                                                                                | 0.20                                                                                |
| Avail Cap(c_a), veh/h         | 347                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0                                                                                 | 0    | 368  | 0                                                                                 | 0     | 109                                                                               | 1339                                                                              | 1405 | 109                                                                                 | 2668                                                                                | 1193                                                                                |
| HCM Platoon Ratio             | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.00                                                                              | 1.00 | 1.00 | 1.00                                                                              | 1.00  | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.00                                                                              | 0.00 | 1.00 | 0.00                                                                              | 0.00  | 0.57                                                                              | 0.57                                                                              | 0.57 | 0.43                                                                                | 0.43                                                                                | 0.43                                                                                |
| Uniform Delay (d), s/veh      | 54.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.0                                                                               | 0.0  | 50.2 | 0.0                                                                               | 0.0   | 64.2                                                                              | 7.5                                                                               | 7.5  | 64.4                                                                                | 9.4                                                                                 | 4.6                                                                                 |
| Incr Delay (d2), s/veh        | 3.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.0                                                                               | 0.0  | 0.6  | 0.0                                                                               | 0.0   | 18.5                                                                              | 1.4                                                                               | 1.3  | 17.3                                                                                | 1.0                                                                                 | 0.2                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.0                                                                               | 0.0  | 0.0  | 0.0                                                                               | 0.0   | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 6.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.0                                                                               | 0.0  | 2.8  | 0.0                                                                               | 0.0   | 0.7                                                                               | 14.9                                                                              | 15.9 | 0.5                                                                                 | 21.8                                                                                | 2.5                                                                                 |
| LnGrp Delay(d),s/veh          | 57.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.0                                                                               | 0.0  | 50.8 | 0.0                                                                               | 0.0   | 82.7                                                                              | 8.9                                                                               | 8.9  | 81.7                                                                                | 10.4                                                                                | 4.8                                                                                 |
| LnGrp LOS                     | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                   |      | D    |                                                                                   |       | F                                                                                 | A                                                                                 | A    | F                                                                                   | B                                                                                   | A                                                                                   |
| Approach Vol, veh/h           | 182                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                   |      |      | 85                                                                                |       | 1787                                                                              |                                                                                   |      |                                                                                     | 2303                                                                                |                                                                                     |
| Approach Delay, s/veh         | 57.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                   |      |      | 50.8                                                                              |       | 9.5                                                                               |                                                                                   |      |                                                                                     | 10.1                                                                                |                                                                                     |
| Approach LOS                  | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                   |      |      | D                                                                                 |       | A                                                                                 |                                                                                   |      |                                                                                     | B                                                                                   |                                                                                     |
| Timer                         | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2                                                                                 | 3    | 4    | 5                                                                                 | 6     | 7                                                                                 | 8                                                                                 |      |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2                                                                                 | 4    |      | 5                                                                                 | 6     | 8                                                                                 |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 5.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 102.0                                                                             | 22.6 |      | 5.0                                                                               | 102.4 | 22.6                                                                              |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 5.0                                                                               | 5.0  |      | 4.0                                                                               | 5.0   | 5.0                                                                               |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 83.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 83.0                                                                              | 25.0 |      | 8.0                                                                               | 83.0  | 25.0                                                                              |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.2), s | 46.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 46.3                                                                              | 7.8  |      | 2.8                                                                               | 32.2  | 17.2                                                                              |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 34.3                                                                              | 0.2  |      | 0.0                                                                               | 39.7  | 0.4                                                                               |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                   |      |      |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                   | 12.7 |      |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                   | B    |      |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 10: Honoapiilani Highway & Kapunakea Street

10/05/2017

|                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                              |  |  |  |  |  |  |  |  |  |   |  |  |
| Movement                     | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations          |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |
| Traffic Volume (veh/h)       | 210                                                                               | 20                                                                                | 50                                                                                | 90                                                                                | 20                                                                                | 20                                                                                | 60                                                                                | 1625                                                                              | 60                                                                                | 15                                                                                  | 1890                                                                                | 140                                                                                 |
| Future Volume (veh/h)        | 210                                                                               | 20                                                                                | 50                                                                                | 90                                                                                | 20                                                                                | 20                                                                                | 60                                                                                | 1625                                                                              | 60                                                                                | 15                                                                                  | 1890                                                                                | 140                                                                                 |
| Number                       | 3                                                                                 | 8                                                                                 | 18                                                                                | 7                                                                                 | 4                                                                                 | 14                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln       | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1900                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h         | 228                                                                               | 22                                                                                | 7                                                                                 | 98                                                                                | 22                                                                                | 4                                                                                 | 65                                                                                | 1766                                                                              | 63                                                                                | 16                                                                                  | 2054                                                                                | 148                                                                                 |
| Adj No. of Lanes             | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 1                                                                                 | 0                                                                                 | 1                                                                                 | 2                                                                                 | 0                                                                                 | 1                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %         | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                   | 314                                                                               | 271                                                                               | 86                                                                                | 311                                                                               | 307                                                                               | 56                                                                                | 83                                                                                | 2429                                                                              | 86                                                                                | 19                                                                                  | 2215                                                                                | 158                                                                                 |
| Arrive On Green              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.20                                                                              | 0.19                                                                              | 0.05                                                                              | 0.70                                                                              | 0.69                                                                              | 0.01                                                                                | 0.88                                                                                | 0.87                                                                                |
| Sat Flow, veh/h              | 1373                                                                              | 1354                                                                              | 431                                                                               | 1370                                                                              | 1533                                                                              | 279                                                                               | 1774                                                                              | 3486                                                                              | 124                                                                               | 1774                                                                                | 3351                                                                                | 239                                                                                 |
| Grp Volume(v), veh/h         | 228                                                                               | 0                                                                                 | 29                                                                                | 98                                                                                | 0                                                                                 | 26                                                                                | 65                                                                                | 892                                                                               | 937                                                                               | 16                                                                                  | 1073                                                                                | 1129                                                                                |
| Grp Sat Flow(s),veh/h/ln     | 1373                                                                              | 0                                                                                 | 1784                                                                              | 1370                                                                              | 0                                                                                 | 1812                                                                              | 1774                                                                              | 1770                                                                              | 1840                                                                              | 1774                                                                                | 1770                                                                                | 1820                                                                                |
| Q Serve(g_s), s              | 21.0                                                                              | 0.0                                                                               | 1.7                                                                               | 8.1                                                                               | 0.0                                                                               | 1.5                                                                               | 4.7                                                                               | 40.1                                                                              | 40.9                                                                              | 1.2                                                                                 | 49.2                                                                                | 56.0                                                                                |
| Cycle Q Clear(g_c), s        | 22.5                                                                              | 0.0                                                                               | 1.7                                                                               | 9.9                                                                               | 0.0                                                                               | 1.5                                                                               | 4.7                                                                               | 40.1                                                                              | 40.9                                                                              | 1.2                                                                                 | 49.2                                                                                | 56.0                                                                                |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 0.24                                                                              | 1.00                                                                              |                                                                                   | 0.15                                                                              | 1.00                                                                              |                                                                                   | 0.07                                                                              | 1.00                                                                                |                                                                                     | 0.13                                                                                |
| Lane Grp Cap(c), veh/h       | 314                                                                               | 0                                                                                 | 357                                                                               | 311                                                                               | 0                                                                                 | 362                                                                               | 83                                                                                | 1233                                                                              | 1282                                                                              | 19                                                                                  | 1170                                                                                | 1203                                                                                |
| V/C Ratio(X)                 | 0.73                                                                              | 0.00                                                                              | 0.08                                                                              | 0.31                                                                              | 0.00                                                                              | 0.07                                                                              | 0.78                                                                              | 0.72                                                                              | 0.73                                                                              | 0.84                                                                                | 0.92                                                                                | 0.94                                                                                |
| Avail Cap(c_a), veh/h        | 367                                                                               | 0                                                                                 | 426                                                                               | 364                                                                               | 0                                                                                 | 432                                                                               | 109                                                                               | 1233                                                                              | 1282                                                                              | 109                                                                                 | 1170                                                                                | 1203                                                                                |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.33                                                                                | 1.33                                                                                | 1.33                                                                                |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.39                                                                              | 0.39                                                                              | 0.39                                                                              | 0.51                                                                                | 0.51                                                                                | 0.51                                                                                |
| Uniform Delay (d), s/veh     | 51.3                                                                              | 0.0                                                                               | 42.3                                                                              | 46.3                                                                              | 0.0                                                                               | 42.3                                                                              | 61.3                                                                              | 12.0                                                                              | 12.2                                                                              | 64.0                                                                                | 5.6                                                                                 | 6.1                                                                                 |
| Incr Delay (d2), s/veh       | 5.9                                                                               | 0.0                                                                               | 0.1                                                                               | 0.6                                                                               | 0.0                                                                               | 0.1                                                                               | 7.2                                                                               | 1.5                                                                               | 1.5                                                                               | 16.7                                                                                | 7.3                                                                                 | 8.8                                                                                 |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln     | 8.5                                                                               | 0.0                                                                               | 0.9                                                                               | 3.1                                                                               | 0.0                                                                               | 0.8                                                                               | 2.5                                                                               | 19.8                                                                              | 21.1                                                                              | 0.7                                                                                 | 24.8                                                                                | 29.1                                                                                |
| LnGrp Delay(d),s/veh         | 57.2                                                                              | 0.0                                                                               | 42.4                                                                              | 46.9                                                                              | 0.0                                                                               | 42.3                                                                              | 68.5                                                                              | 13.5                                                                              | 13.6                                                                              | 80.7                                                                                | 12.9                                                                                | 15.0                                                                                |
| LnGrp LOS                    | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 |                                                                                   | D                                                                                 | E                                                                                 | B                                                                                 | B                                                                                 | F                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h          | 257                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 124                                                                               |                                                                                   | 1894                                                                              |                                                                                   | 2218                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh        | 55.6                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 45.9                                                                              |                                                                                   | 15.5                                                                              |                                                                                   | 14.5                                                                                |                                                                                     |                                                                                     |
| Approach LOS                 | E                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                   | B                                                                                 |                                                                                   | B                                                                                   |                                                                                     |                                                                                     |
| Timer                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                 | 1                                                                                 | 2                                                                                 | 4                                                                                 |                                                                                   | 5                                                                                 | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s     | 30.1                                                                              | 89.9                                                                              | 30.0                                                                              |                                                                                   | 5.4                                                                               | 94.6                                                                              | 30.0                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s      | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s  | 78.0                                                                              | 78.0                                                                              | 30.0                                                                              |                                                                                   | 8.0                                                                               | 78.0                                                                              | 30.0                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+10, s) | 58.0                                                                              | 58.0                                                                              | 11.9                                                                              |                                                                                   | 3.2                                                                               | 42.9                                                                              | 24.5                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s      | 0.0                                                                               | 18.5                                                                              | 0.4                                                                               |                                                                                   | 0.0                                                                               | 26.2                                                                              | 0.5                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay          |                                                                                   |                                                                                   | 18.1                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

# HCM 2010 Signalized Intersection Summary

## 11: Honoapiilani Highway & Keawe Street

10/05/2017

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |  |   |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |                                                                                   |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)        | 65                                                                                | 150                                                                               | 90                                                                                | 145                                                                               | 130                                                                               | 715                                                                               | 80                                                                                | 950                                                                               | 195                                                                               | 610                                                                                 | 1175                                                                                | 105                                                                                 |
| Future Volume (veh/h)         | 65                                                                                | 150                                                                               | 90                                                                                | 145                                                                               | 130                                                                               | 715                                                                               | 80                                                                                | 950                                                                               | 195                                                                               | 610                                                                                 | 1175                                                                                | 105                                                                                 |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 1                                                                                 | 6                                                                                 | 16                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj(A_pbT)           | 0.98                                                                              |                                                                                   | 0.96                                                                              | 1.00                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                                |                                                                                     | 1.00                                                                                |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Adj Sat Flow, veh/h/ln        | 1900                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                              | 1863                                                                                | 1863                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h          | 71                                                                                | 163                                                                               | 11                                                                                | 158                                                                               | 141                                                                               | 397                                                                               | 87                                                                                | 1033                                                                              | 125                                                                               | 663                                                                                 | 1277                                                                                | 110                                                                                 |
| Adj No. of Lanes              | 0                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | 2                                                                                 | 1                                                                                 | 2                                                                                   | 2                                                                                   | 0                                                                                   |
| Peak Hour Factor              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Cap, veh/h                    | 106                                                                               | 192                                                                               | 282                                                                               | 250                                                                               | 577                                                                               | 477                                                                               | 110                                                                               | 1359                                                                              | 599                                                                               | 737                                                                                 | 1769                                                                                | 152                                                                                 |
| Arrive On Green               | 0.19                                                                              | 0.19                                                                              | 0.19                                                                              | 0.09                                                                              | 0.31                                                                              | 0.31                                                                              | 0.06                                                                              | 0.38                                                                              | 0.38                                                                              | 0.21                                                                                | 0.54                                                                                | 0.53                                                                                |
| Sat Flow, veh/h               | 378                                                                               | 1030                                                                              | 1514                                                                              | 1774                                                                              | 1863                                                                              | 1542                                                                              | 1774                                                                              | 3539                                                                              | 1561                                                                              | 3442                                                                                | 3299                                                                                | 283                                                                                 |
| Grp Volume(v), veh/h          | 234                                                                               | 0                                                                                 | 11                                                                                | 158                                                                               | 141                                                                               | 397                                                                               | 87                                                                                | 1033                                                                              | 125                                                                               | 663                                                                                 | 684                                                                                 | 703                                                                                 |
| Grp Sat Flow(s),veh/h/ln      | 1408                                                                              | 0                                                                                 | 1514                                                                              | 1774                                                                              | 1863                                                                              | 1542                                                                              | 1774                                                                              | 1770                                                                              | 1561                                                                              | 1721                                                                                | 1770                                                                                | 1812                                                                                |
| Q Serve(g_s), s               | 18.9                                                                              | 0.0                                                                               | 0.8                                                                               | 9.0                                                                               | 7.4                                                                               | 31.1                                                                              | 6.3                                                                               | 33.0                                                                              | 7.0                                                                               | 24.4                                                                                | 37.9                                                                                | 38.3                                                                                |
| Cycle Q Clear(g_c), s         | 21.0                                                                              | 0.0                                                                               | 0.8                                                                               | 9.0                                                                               | 7.4                                                                               | 31.1                                                                              | 6.3                                                                               | 33.0                                                                              | 7.0                                                                               | 24.4                                                                                | 37.9                                                                                | 38.3                                                                                |
| Prop In Lane                  | 0.30                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                                |                                                                                     | 0.16                                                                                |
| Lane Grp Cap(c), veh/h        | 298                                                                               | 0                                                                                 | 282                                                                               | 250                                                                               | 577                                                                               | 477                                                                               | 110                                                                               | 1359                                                                              | 599                                                                               | 737                                                                                 | 949                                                                                 | 972                                                                                 |
| V/C Ratio(X)                  | 0.78                                                                              | 0.00                                                                              | 0.04                                                                              | 0.63                                                                              | 0.24                                                                              | 0.83                                                                              | 0.79                                                                              | 0.76                                                                              | 0.21                                                                              | 0.90                                                                                | 0.72                                                                                | 0.72                                                                                |
| Avail Cap(c_a), veh/h         | 317                                                                               | 0                                                                                 | 303                                                                               | 276                                                                               | 630                                                                               | 522                                                                               | 328                                                                               | 1359                                                                              | 599                                                                               | 953                                                                                 | 949                                                                                 | 972                                                                                 |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.79                                                                              | 0.79                                                                              | 0.79                                                                              | 0.25                                                                                | 0.25                                                                                | 0.25                                                                                |
| Uniform Delay (d), s/veh      | 51.3                                                                              | 0.0                                                                               | 43.4                                                                              | 37.9                                                                              | 33.5                                                                              | 41.7                                                                              | 60.2                                                                              | 34.8                                                                              | 26.8                                                                              | 49.7                                                                                | 22.8                                                                                | 22.9                                                                                |
| Incr Delay (d2), s/veh        | 11.6                                                                              | 0.0                                                                               | 0.1                                                                               | 4.0                                                                               | 0.2                                                                               | 10.3                                                                              | 3.8                                                                               | 3.2                                                                               | 0.6                                                                               | 2.3                                                                                 | 1.2                                                                                 | 1.2                                                                                 |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| %ile BackOfQ(50%),veh/ln      | 0.1                                                                               | 0.0                                                                               | 0.3                                                                               | 4.6                                                                               | 3.8                                                                               | 14.6                                                                              | 3.2                                                                               | 16.7                                                                              | 3.1                                                                               | 11.8                                                                                | 18.7                                                                                | 19.3                                                                                |
| LnGrp Delay(d),s/veh          | 62.8                                                                              | 0.0                                                                               | 43.4                                                                              | 41.9                                                                              | 33.7                                                                              | 52.0                                                                              | 64.0                                                                              | 38.1                                                                              | 27.4                                                                              | 52.0                                                                                | 24.0                                                                                | 24.1                                                                                |
| LnGrp LOS                     | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 | C                                                                                 | D                                                                                 | E                                                                                 | D                                                                                 | C                                                                                 | D                                                                                   | C                                                                                   | C                                                                                   |
| Approach Vol, veh/h           | 245                                                                               |                                                                                   |                                                                                   |                                                                                   | 696                                                                               |                                                                                   |                                                                                   |                                                                                   | 1245                                                                              |                                                                                     | 2050                                                                                |                                                                                     |
| Approach Delay, s/veh         | 62.0                                                                              |                                                                                   |                                                                                   |                                                                                   | 46.0                                                                              |                                                                                   |                                                                                   |                                                                                   | 38.8                                                                              |                                                                                     | 33.1                                                                                |                                                                                     |
| Approach LOS                  | E                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                     | C                                                                                   |                                                                                     |
| Timer                         | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                 | 8                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 8                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 12.0                                                                              | 73.7                                                                              | 16.0                                                                              | 28.2                                                                              | 31.9                                                                              | 53.9                                                                              | 44.2                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 4.0                                                                               | 5.0                                                                               | 5.0                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Green Setting (Gmax), s   | 24.0                                                                              | 49.0                                                                              | 13.0                                                                              | 25.0                                                                              | 36.0                                                                              | 37.0                                                                              | 43.0                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear Time (g_c+1.0), s | 19.3                                                                              | 40.3                                                                              | 11.0                                                                              | 23.0                                                                              | 26.4                                                                              | 35.0                                                                              | 33.1                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (p_c), s       | 0.1                                                                               | 6.7                                                                               | 0.1                                                                               | 0.2                                                                               | 1.5                                                                               | 1.6                                                                               | 1.9                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 Ctrl Delay           |                                                                                   |                                                                                   | 38.6                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2010 LOS                  |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Notes                         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

HCM 2010 TWSC  
12: RIRO Access & Honoapiilani Highway

10/05/2017

| Intersection             |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
|--------------------------|--------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh         | 0.9    |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
| Movement                 | WBL    | WBR                                                                               | NBT                                                                               | NBR                                                                               | SBL    | SBT                                                                                 |
| Lane Configurations      |        |  |  |  |        |  |
| Traffic Vol, veh/h       | 0      | 95                                                                                | 740                                                                               | 110                                                                               | 0      | 970                                                                                 |
| Future Vol, veh/h        | 0      | 95                                                                                | 740                                                                               | 110                                                                               | 0      | 970                                                                                 |
| Conflicting Peds, #/hr   | 0      | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0      | 0                                                                                   |
| Sign Control             | Stop   | Stop                                                                              | Free                                                                              | Free                                                                              | Free   | Free                                                                                |
| RT Channelized           | -      | None                                                                              | -                                                                                 | None                                                                              | -      | None                                                                                |
| Storage Length           | -      | 0                                                                                 | -                                                                                 | 0                                                                                 | -      | -                                                                                   |
| Veh in Median Storage, # | 0      | -                                                                                 | 0                                                                                 | -                                                                                 | -      | 0                                                                                   |
| Grade, %                 | 0      | -                                                                                 | 0                                                                                 | -                                                                                 | -      | 0                                                                                   |
| Peak Hour Factor         | 92     | 92                                                                                | 92                                                                                | 92                                                                                | 92     | 92                                                                                  |
| Heavy Vehicles, %        | 2      | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2      | 2                                                                                   |
| Mvmt Flow                | 0      | 103                                                                               | 804                                                                               | 120                                                                               | 0      | 1054                                                                                |
|                          |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
| Major/Minor              | Minor1 |                                                                                   | Major1                                                                            |                                                                                   | Major2 |                                                                                     |
| Conflicting Flow All     | -      | 804                                                                               | 0                                                                                 | 0                                                                                 | -      | -                                                                                   |
| Stage 1                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Stage 2                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Critical Hdwy            | -      | 6.22                                                                              | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Critical Hdwy Stg 1      | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Critical Hdwy Stg 2      | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Follow-up Hdwy           | -      | 3.318                                                                             | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Pot Cap-1 Maneuver       | 0      | 383                                                                               | -                                                                                 | -                                                                                 | 0      | -                                                                                   |
| Stage 1                  | 0      | -                                                                                 | -                                                                                 | -                                                                                 | 0      | -                                                                                   |
| Stage 2                  | 0      | -                                                                                 | -                                                                                 | -                                                                                 | 0      | -                                                                                   |
| Platoon blocked, %       |        |                                                                                   | -                                                                                 | -                                                                                 |        | -                                                                                   |
| Mov Cap-1 Maneuver       | -      | 383                                                                               | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Mov Cap-2 Maneuver       | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Stage 1                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
| Stage 2                  | -      | -                                                                                 | -                                                                                 | -                                                                                 | -      | -                                                                                   |
|                          |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
| Approach                 | WB     |                                                                                   | NB                                                                                |                                                                                   | SB     |                                                                                     |
| HCM Control Delay, s     | 17.8   |                                                                                   | 0                                                                                 |                                                                                   | 0      |                                                                                     |
| HCM LOS                  | C      |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
|                          |        |                                                                                   |                                                                                   |                                                                                   |        |                                                                                     |
| Minor Lane/Major Mvmt    | NBT    | NBRWBLn1                                                                          | SBT                                                                               |                                                                                   |        |                                                                                     |
| Capacity (veh/h)         | -      | - 383                                                                             | -                                                                                 |                                                                                   |        |                                                                                     |
| HCM Lane V/C Ratio       | -      | - 0.27                                                                            | -                                                                                 |                                                                                   |        |                                                                                     |
| HCM Control Delay (s)    | -      | - 17.8                                                                            | -                                                                                 |                                                                                   |        |                                                                                     |
| HCM Lane LOS             | -      | - C                                                                               | -                                                                                 |                                                                                   |        |                                                                                     |
| HCM 95th %tile Q(veh)    | -      | - 1.1                                                                             | -                                                                                 |                                                                                   |        |                                                                                     |

| Intersection                                                                                                         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
|----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh                                                                                                     | 1.8                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Movement                                                                                                             | WBL                                                                               | WBR                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                                 | SBT                                                                                 |
| Lane Configurations                                                                                                  |  |  |  |  |  |  |
| Traffic Vol, veh/h                                                                                                   | 60                                                                                | 35                                                                                | 940                                                                               | 75                                                                                | 40                                                                                  | 1030                                                                                |
| Future Vol, veh/h                                                                                                    | 60                                                                                | 35                                                                                | 940                                                                               | 75                                                                                | 40                                                                                  | 1030                                                                                |
| Conflicting Peds, #/hr                                                                                               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   |
| Sign Control                                                                                                         | Stop                                                                              | Stop                                                                              | Free                                                                              | Free                                                                              | Free                                                                                | Free                                                                                |
| RT Channelized                                                                                                       | -                                                                                 | None                                                                              | -                                                                                 | None                                                                              | -                                                                                   | None                                                                                |
| Storage Length                                                                                                       | 0                                                                                 | 100                                                                               | -                                                                                 | 100                                                                               | 100                                                                                 | -                                                                                   |
| Veh in Median Storage, #                                                                                             | 0                                                                                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                   | 0                                                                                   |
| Grade, %                                                                                                             | 0                                                                                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                   | 0                                                                                   |
| Peak Hour Factor                                                                                                     | 92                                                                                | 92                                                                                | 92                                                                                | 92                                                                                | 92                                                                                  | 92                                                                                  |
| Heavy Vehicles, %                                                                                                    | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   |
| Mvmt Flow                                                                                                            | 65                                                                                | 38                                                                                | 1022                                                                              | 82                                                                                | 43                                                                                  | 1120                                                                                |
| Major/Minor                                                                                                          | Minor1                                                                            | Major1                                                                            |                                                                                   | Major2                                                                            |                                                                                     |                                                                                     |
| Conflicting Flow All                                                                                                 | 2228                                                                              | 1022                                                                              | 0                                                                                 | 0                                                                                 | 1104                                                                                | 0                                                                                   |
| Stage 1                                                                                                              | 1022                                                                              | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 2                                                                                                              | 1206                                                                              | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Critical Hdwy                                                                                                        | 6.42                                                                              | 6.22                                                                              | -                                                                                 | -                                                                                 | 4.12                                                                                | -                                                                                   |
| Critical Hdwy Stg 1                                                                                                  | 5.42                                                                              | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Critical Hdwy Stg 2                                                                                                  | 5.42                                                                              | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Follow-up Hdwy                                                                                                       | 3.518                                                                             | 3.318                                                                             | -                                                                                 | -                                                                                 | 2.218                                                                               | -                                                                                   |
| Pot Cap-1 Maneuver                                                                                                   | ~ 47                                                                              | 287                                                                               | -                                                                                 | -                                                                                 | 632                                                                                 | -                                                                                   |
| Stage 1                                                                                                              | 347                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 2                                                                                                              | 283                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Platoon blocked, %                                                                                                   |                                                                                   |                                                                                   | -                                                                                 | -                                                                                 |                                                                                     | -                                                                                   |
| Mov Cap-1 Maneuver                                                                                                   | ~ 44                                                                              | 287                                                                               | -                                                                                 | -                                                                                 | 632                                                                                 | -                                                                                   |
| Mov Cap-2 Maneuver                                                                                                   | 145                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 1                                                                                                              | 323                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Stage 2                                                                                                              | 283                                                                               | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                   | -                                                                                   |
| Approach                                                                                                             | WB                                                                                | NB                                                                                |                                                                                   | SB                                                                                |                                                                                     |                                                                                     |
| HCM Control Delay, s                                                                                                 | 37.9                                                                              | 0                                                                                 |                                                                                   | 0.4                                                                               |                                                                                     |                                                                                     |
| HCM LOS                                                                                                              | E                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Minor Lane/Major Mvmt                                                                                                | NBT                                                                               | NBR                                                                               | WBLn1                                                                             | WBLn2                                                                             | SBL                                                                                 | SBT                                                                                 |
| Capacity (veh/h)                                                                                                     | -                                                                                 | -                                                                                 | 145                                                                               | 287                                                                               | 632                                                                                 | -                                                                                   |
| HCM Lane V/C Ratio                                                                                                   | -                                                                                 | -                                                                                 | 0.45                                                                              | 0.133                                                                             | 0.069                                                                               | -                                                                                   |
| HCM Control Delay (s)                                                                                                | -                                                                                 | -                                                                                 | 48.7                                                                              | 19.5                                                                              | 11.1                                                                                | -                                                                                   |
| HCM Lane LOS                                                                                                         | -                                                                                 | -                                                                                 | E                                                                                 | C                                                                                 | B                                                                                   | -                                                                                   |
| HCM 95th %tile Q(veh)                                                                                                | -                                                                                 | -                                                                                 | 2                                                                                 | 0.5                                                                               | 0.2                                                                                 | -                                                                                   |
| Notes                                                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    *: All major volume in platoon |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |

HCM 2010 TWSC  
14: Road A & Akahele Street

10/05/2017

| Intersection             |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|--------|-------------------------------------------------------------------------------------|-------|--------|-------------------------------------------------------------------------------------|-------|
| Int Delay, s/veh         | 11.1                                                                              |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Movement                 | EBL                                                                               | EBT                                                                               | EBR  | WBL                                                                               | WBT                                                                               | WBR  | NBL    | NBT                                                                                 | NBR   | SBL    | SBT                                                                                 | SBR   |
| Lane Configurations      |  |  |      |  |  |      |        |  |       |        |  |       |
| Traffic Vol, veh/h       | 190                                                                               | 105                                                                               | 125  | 5                                                                                 | 95                                                                                | 5    | 115    | 5                                                                                   | 5     | 5      | 5                                                                                   | 180   |
| Future Vol, veh/h        | 190                                                                               | 105                                                                               | 125  | 5                                                                                 | 95                                                                                | 5    | 115    | 5                                                                                   | 5     | 5      | 5                                                                                   | 180   |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0      | 0                                                                                   | 0     | 0      | 0                                                                                   | 0     |
| Sign Control             | Free                                                                              | Free                                                                              | Free | Free                                                                              | Free                                                                              | Free | Stop   | Stop                                                                                | Stop  | Stop   | Stop                                                                                | Stop  |
| RT Channelized           | -                                                                                 | -                                                                                 | None | -                                                                                 | -                                                                                 | None | -      | -                                                                                   | None  | -      | -                                                                                   | None  |
| Storage Length           | 100                                                                               | -                                                                                 | -    | 100                                                                               | -                                                                                 | -    | -      | -                                                                                   | -     | -      | -                                                                                   | -     |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | -    | -                                                                                 | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Grade, %                 | -                                                                                 | 0                                                                                 | -    | -                                                                                 | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Peak Hour Factor         | 92                                                                                | 92                                                                                | 92   | 92                                                                                | 92                                                                                | 92   | 92     | 92                                                                                  | 92    | 92     | 92                                                                                  | 92    |
| Heavy Vehicles, %        | 2                                                                                 | 2                                                                                 | 2    | 2                                                                                 | 2                                                                                 | 2    | 2      | 2                                                                                   | 2     | 2      | 2                                                                                   | 2     |
| Mvmt Flow                | 207                                                                               | 114                                                                               | 136  | 5                                                                                 | 103                                                                               | 5    | 125    | 5                                                                                   | 5     | 5      | 5                                                                                   | 196   |
|                          |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Major/Minor              | Major1                                                                            |                                                                                   |      | Major2                                                                            |                                                                                   |      | Minor1 |                                                                                     |       | Minor2 |                                                                                     |       |
| Conflicting Flow All     | 108                                                                               | 0                                                                                 | 0    | 250                                                                               | 0                                                                                 | 0    | 812    | 714                                                                                 | 182   | 717    | 780                                                                                 | 106   |
| Stage 1                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 596    | 596                                                                                 | -     | 116    | 116                                                                                 | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 216    | 118                                                                                 | -     | 601    | 664                                                                                 | -     |
| Critical Hdwy            | 4.12                                                                              | -                                                                                 | -    | 4.12                                                                              | -                                                                                 | -    | 7.12   | 6.52                                                                                | 6.22  | 7.12   | 6.52                                                                                | 6.22  |
| Critical Hdwy Stg 1      | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Critical Hdwy Stg 2      | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Follow-up Hdwy           | 2.218                                                                             | -                                                                                 | -    | 2.218                                                                             | -                                                                                 | -    | 3.518  | 4.018                                                                               | 3.318 | 3.518  | 4.018                                                                               | 3.318 |
| Pot Cap-1 Maneuver       | 1483                                                                              | -                                                                                 | -    | 1316                                                                              | -                                                                                 | -    | 298    | 357                                                                                 | 861   | 345    | 327                                                                                 | 948   |
| Stage 1                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 490    | 492                                                                                 | -     | 889    | 800                                                                                 | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 786    | 798                                                                                 | -     | 487    | 458                                                                                 | -     |
| Platoon blocked, %       |                                                                                   | -                                                                                 | -    |                                                                                   | -                                                                                 | -    |        |                                                                                     |       |        |                                                                                     |       |
| Mov Cap-1 Maneuver       | 1483                                                                              | -                                                                                 | -    | 1316                                                                              | -                                                                                 | -    | 207    | 306                                                                                 | 861   | 301    | 280                                                                                 | 948   |
| Mov Cap-2 Maneuver       | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 207    | 306                                                                                 | -     | 301    | 280                                                                                 | -     |
| Stage 1                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 421    | 423                                                                                 | -     | 765    | 797                                                                                 | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -    | -                                                                                 | -                                                                                 | -    | 617    | 795                                                                                 | -     | 411    | 394                                                                                 | -     |
|                          |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Approach                 | EB                                                                                |                                                                                   |      | WB                                                                                |                                                                                   |      | NB     |                                                                                     |       | SB     |                                                                                     |       |
| HCM Control Delay, s     | 3.5                                                                               |                                                                                   |      | 0.4                                                                               |                                                                                   |      | 46.3   |                                                                                     |       | 10.6   |                                                                                     |       |
| HCM LOS                  |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      | E      |                                                                                     |       | B      |                                                                                     |       |
|                          |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Minor Lane/Major Mvmt    | NBLn1                                                                             | EBL                                                                               | EBT  | EBR                                                                               | WBL                                                                               | WBT  | WBR    | SBLn1                                                                               |       |        |                                                                                     |       |
| Capacity (veh/h)         | 216                                                                               | 1483                                                                              | -    | -                                                                                 | 1316                                                                              | -    | -      | 847                                                                                 |       |        |                                                                                     |       |
| HCM Lane V/C Ratio       | 0.629                                                                             | 0.139                                                                             | -    | -                                                                                 | 0.004                                                                             | -    | -      | 0.244                                                                               |       |        |                                                                                     |       |
| HCM Control Delay (s)    | 46.3                                                                              | 7.8                                                                               | -    | -                                                                                 | 7.7                                                                               | -    | -      | 10.6                                                                                |       |        |                                                                                     |       |
| HCM Lane LOS             | E                                                                                 | A                                                                                 | -    | -                                                                                 | A                                                                                 | -    | -      | B                                                                                   |       |        |                                                                                     |       |
| HCM 95th %tile O(veh)    | 3.7                                                                               | 0.5                                                                               | -    | -                                                                                 | 0                                                                                 | -    | -      | 1                                                                                   |       |        |                                                                                     |       |

| Intersection             |        |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
|--------------------------|--------|-----------------------------------------------------------------------------------|------|--------|-----------------------------------------------------------------------------------|------|--------|-------------------------------------------------------------------------------------|-------|--------|-------------------------------------------------------------------------------------|-------|
| Int Delay, s/veh         | 4.8    |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Movement                 | EBL    | EBT                                                                               | EBR  | WBL    | WBT                                                                               | WBR  | NBL    | NBT                                                                                 | NBR   | SBL    | SBT                                                                                 | SBR   |
| Lane Configurations      |        |  |      |        |  |      |        |  |       |        |  |       |
| Traffic Vol, veh/h       | 25     | 20                                                                                | 65   | 5      | 25                                                                                | 5    | 55     | 5                                                                                   | 5     | 5      | 5                                                                                   | 20    |
| Future Vol, veh/h        | 25     | 20                                                                                | 65   | 5      | 25                                                                                | 5    | 55     | 5                                                                                   | 5     | 5      | 5                                                                                   | 20    |
| Conflicting Peds, #/hr   | 0      | 0                                                                                 | 0    | 0      | 0                                                                                 | 0    | 0      | 0                                                                                   | 0     | 0      | 0                                                                                   | 0     |
| Sign Control             | Free   | Free                                                                              | Free | Free   | Free                                                                              | Free | Stop   | Stop                                                                                | Stop  | Stop   | Stop                                                                                | Stop  |
| RT Channelized           | -      | -                                                                                 | None | -      | -                                                                                 | None | -      | -                                                                                   | None  | -      | -                                                                                   | None  |
| Storage Length           | -      | -                                                                                 | -    | -      | -                                                                                 | -    | -      | -                                                                                   | -     | -      | -                                                                                   | -     |
| Veh in Median Storage, # | -      | 0                                                                                 | -    | -      | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Grade, %                 | -      | 0                                                                                 | -    | -      | 0                                                                                 | -    | -      | 0                                                                                   | -     | -      | 0                                                                                   | -     |
| Peak Hour Factor         | 92     | 92                                                                                | 92   | 92     | 92                                                                                | 92   | 92     | 92                                                                                  | 92    | 92     | 92                                                                                  | 92    |
| Heavy Vehicles, %        | 2      | 2                                                                                 | 2    | 2      | 2                                                                                 | 2    | 2      | 2                                                                                   | 2     | 2      | 2                                                                                   | 2     |
| Mvmt Flow                | 27     | 22                                                                                | 71   | 5      | 27                                                                                | 5    | 60     | 5                                                                                   | 5     | 5      | 5                                                                                   | 22    |
|                          |        |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Major/Minor              | Major1 |                                                                                   |      | Major2 |                                                                                   |      | Minor1 |                                                                                     |       | Minor2 |                                                                                     |       |
| Conflicting Flow All     | 32     | 0                                                                                 | 0    | 93     | 0                                                                                 | 0    | 165    | 154                                                                                 | 58    | 157    | 187                                                                                 | 30    |
| Stage 1                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 112    | 112                                                                                 | -     | 40     | 40                                                                                  | -     |
| Stage 2                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 53     | 42                                                                                  | -     | 117    | 147                                                                                 | -     |
| Critical Hdwy            | 4.12   | -                                                                                 | -    | 4.12   | -                                                                                 | -    | 7.12   | 6.52                                                                                | 6.22  | 7.12   | 6.52                                                                                | 6.22  |
| Critical Hdwy Stg 1      | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Critical Hdwy Stg 2      | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 6.12   | 5.52                                                                                | -     | 6.12   | 5.52                                                                                | -     |
| Follow-up Hdwy           | 2.218  | -                                                                                 | -    | 2.218  | -                                                                                 | -    | 3.518  | 4.018                                                                               | 3.318 | 3.518  | 4.018                                                                               | 3.318 |
| Pot Cap-1 Maneuver       | 1580   | -                                                                                 | -    | 1501   | -                                                                                 | -    | 800    | 738                                                                                 | 1008  | 809    | 708                                                                                 | 1044  |
| Stage 1                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 893    | 803                                                                                 | -     | 975    | 862                                                                                 | -     |
| Stage 2                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 960    | 860                                                                                 | -     | 888    | 775                                                                                 | -     |
| Platoon blocked, %       |        | -                                                                                 | -    |        | -                                                                                 | -    |        |                                                                                     |       |        |                                                                                     |       |
| Mov Cap-1 Maneuver       | 1580   | -                                                                                 | -    | 1501   | -                                                                                 | -    | 766    | 723                                                                                 | 1008  | 787    | 693                                                                                 | 1044  |
| Mov Cap-2 Maneuver       | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 766    | 723                                                                                 | -     | 787    | 693                                                                                 | -     |
| Stage 1                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 877    | 789                                                                                 | -     | 957    | 859                                                                                 | -     |
| Stage 2                  | -      | -                                                                                 | -    | -      | -                                                                                 | -    | 931    | 857                                                                                 | -     | 861    | 761                                                                                 | -     |
|                          |        |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Approach                 | EB     |                                                                                   |      | WB     |                                                                                   |      | NB     |                                                                                     |       | SB     |                                                                                     |       |
| HCM Control Delay, s     | 1.7    |                                                                                   |      | 1.1    |                                                                                   |      | 10.1   |                                                                                     |       | 9.1    |                                                                                     |       |
| HCM LOS                  |        |                                                                                   |      |        |                                                                                   |      | B      |                                                                                     |       | A      |                                                                                     |       |
|                          |        |                                                                                   |      |        |                                                                                   |      |        |                                                                                     |       |        |                                                                                     |       |
| Minor Lane/Major Mvmt    | NBLn1  | EBL                                                                               | EBT  | EBR    | WBL                                                                               | WBT  | WBR    | SBLn1                                                                               |       |        |                                                                                     |       |
| Capacity (veh/h)         | 777    | 1580                                                                              | -    | -      | 1501                                                                              | -    | -      | 917                                                                                 |       |        |                                                                                     |       |
| HCM Lane V/C Ratio       | 0.091  | 0.017                                                                             | -    | -      | 0.004                                                                             | -    | -      | 0.036                                                                               |       |        |                                                                                     |       |
| HCM Control Delay (s)    | 10.1   | 7.3                                                                               | 0    | -      | 7.4                                                                               | 0    | -      | 9.1                                                                                 |       |        |                                                                                     |       |
| HCM Lane LOS             | B      | A                                                                                 | A    | -      | A                                                                                 | A    | -      | A                                                                                   |       |        |                                                                                     |       |
| HCM 95th %tile O(veh)    | 0.3    | 0.1                                                                               | -    | -      | 0                                                                                 | -    | -      | 0.1                                                                                 |       |        |                                                                                     |       |



Intersection

Int Delay, s/veh 2.1

| Movement                 | EBT                                                                               | EBR  | WBL  | WBT                                                                               | NBL                                                                                 | NBR  |
|--------------------------|-----------------------------------------------------------------------------------|------|------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------|
| Lane Configurations      |  |      |      |  |  |      |
| Traffic Vol, veh/h       | 60                                                                                | 55   | 5    | 55                                                                                | 40                                                                                  | 5    |
| Future Vol, veh/h        | 60                                                                                | 55   | 5    | 55                                                                                | 40                                                                                  | 5    |
| Conflicting Peds, #/hr   | 0                                                                                 | 0    | 0    | 0                                                                                 | 0                                                                                   | 0    |
| Sign Control             | Free                                                                              | Free | Free | Free                                                                              | Stop                                                                                | Stop |
| RT Channelized           | -                                                                                 | None | -    | None                                                                              | -                                                                                   | None |
| Storage Length           | -                                                                                 | -    | -    | -                                                                                 | 0                                                                                   | -    |
| Veh in Median Storage, # | 0                                                                                 | -    | -    | 0                                                                                 | 0                                                                                   | -    |
| Grade, %                 | 0                                                                                 | -    | -    | 0                                                                                 | 0                                                                                   | -    |
| Peak Hour Factor         | 92                                                                                | 92   | 92   | 92                                                                                | 92                                                                                  | 92   |
| Heavy Vehicles, %        | 2                                                                                 | 2    | 2    | 2                                                                                 | 2                                                                                   | 2    |
| Mvmt Flow                | 65                                                                                | 60   | 5    | 60                                                                                | 43                                                                                  | 5    |

| Major/Minor          | Major1 | Major2 | Minor1 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | 0      | 0      | 125    |
| Stage 1              | -      | -      | 95     |
| Stage 2              | -      | -      | 70     |
| Critical Hdwy        | -      | 4.12   | 6.42   |
| Critical Hdwy Stg 1  | -      | -      | 5.42   |
| Critical Hdwy Stg 2  | -      | -      | 5.42   |
| Follow-up Hdwy       | -      | 2.218  | 3.518  |
| Pot Cap-1 Maneuver   | -      | 1462   | 826    |
| Stage 1              | -      | -      | 929    |
| Stage 2              | -      | -      | 953    |
| Platoon blocked, %   | -      | -      | -      |
| Mov Cap-1 Maneuver   | -      | 1462   | 823    |
| Mov Cap-2 Maneuver   | -      | -      | 823    |
| Stage 1              | -      | -      | 925    |
| Stage 2              | -      | -      | 953    |

| Approach             | EB | WB  | NB  |
|----------------------|----|-----|-----|
| HCM Control Delay, s | 0  | 0.6 | 9.6 |
| HCM LOS              |    |     | A   |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL   | WBT |
|-----------------------|-------|-----|-----|-------|-----|
| Capacity (veh/h)      | 836   | -   | -   | 1462  | -   |
| HCM Lane V/C Ratio    | 0.059 | -   | -   | 0.004 | -   |
| HCM Control Delay (s) | 9.6   | -   | -   | 7.5   | 0   |
| HCM Lane LOS          | A     | -   | -   | A     | A   |
| HCM 95th %tile Q(veh) | 0.2   | -   | -   | 0     | -   |

HCM 2010 Roundabout  
17: Road F & Road J

10/05/2017

| Intersection                |       |       |       |
|-----------------------------|-------|-------|-------|
| Intersection Delay, s/veh   | 3.5   |       |       |
| Intersection LOS            | A     |       |       |
| Approach                    | EB    | WB    | NB    |
| Entry Lanes                 | 1     | 1     | 1     |
| Conflicting Circle Lanes    | 1     | 1     | 1     |
| Adj Approach Flow, veh/h    | 38    | 21    | 21    |
| Demand Flow Rate, veh/h     | 38    | 21    | 21    |
| Vehicles Circulating, veh/h | 5     | 16    | 22    |
| Vehicles Exiting, veh/h     | 32    | 27    | 21    |
| Follow-Up Headway, s        | 3.186 | 3.186 | 3.186 |
| Ped Vol Crossing Leg, #/h   | 0     | 0     | 0     |
| Ped Cap Adj                 | 1.000 | 1.000 | 1.000 |
| Approach Delay, s/veh       | 3.5   | 3.4   | 3.4   |
| Approach LOS                | A     | A     | A     |
| Lane                        | Left  | Left  | Left  |
| Designated Moves            | TR    | LT    | LR    |
| Assumed Moves               | TR    | LT    | LR    |
| RT Channelized              |       |       |       |
| Lane Util                   | 1.000 | 1.000 | 1.000 |
| Critical Headway, s         | 5.193 | 5.193 | 5.193 |
| Entry Flow, veh/h           | 38    | 21    | 21    |
| Cap Entry Lane, veh/h       | 1124  | 1112  | 1105  |
| Entry HV Adj Factor         | 0.989 | 0.985 | 1.000 |
| Flow Entry, veh/h           | 38    | 21    | 21    |
| Cap Entry, veh/h            | 1112  | 1095  | 1105  |
| V/C Ratio                   | 0.034 | 0.019 | 0.019 |
| Control Delay, s/veh        | 3.5   | 3.4   | 3.4   |
| LOS                         | A     | A     | A     |
| 95th %tile Queue, veh       | 0     | 0     | 0     |



---

---

## APPENDIX D

### ROADWAY IMPROVEMENTS PLAN

---

---

Appendix D: Roadway Improvements Summary

| Buildout Year                                     | Project Scenario | Intersection                                                   | Roadway Improvement                                                                                                                                                                                                                                                                                                                        |
|---------------------------------------------------|------------------|----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ROADWAY IMPROVEMENTS WITHOUT PULELEHUA            |                  |                                                                |                                                                                                                                                                                                                                                                                                                                            |
| Planned Roadway Improvements<br>(Without Project) | --               | Lahaina Bypass Road                                            | <u>Lahaina Bypass Road (LBR) Phase 1B-2</u><br>- Extend LBR from Hokiokio Place to its southern terminus with Honoapiilani Highway<br>- Reroute all northbound traffic to use LBR instead of Honoapiilani Highway<br>- Signalize and modify intersection laneage along LBR at its intersections with Kai Hele Ku Street and Hokiokio Place |
|                                                   |                  | Honoapiilani Highway/<br>Keawe Street/<br>Lahaina Cannery Mall | - Construct an additional southbound left-turn lane, resulting in dual southbound left-turn lanes<br>- Optimize signal timing plans along the coordinated corridor from Leialii Parkway to Keawe Street                                                                                                                                    |
|                                                   |                  | Honoapiilani Highway/<br>Napilihau Street                      | - Construct an exclusive right-turn lane on the northbound Honoapiilani Highway approach<br>- Construct an exclusive left-turn lane and shared through/right-turn lane on the westbound Napilihau Street approach                                                                                                                          |
| Base Year 2022<br>(Without Project)               | --               | Honoapiilani Highway/<br>Kaanapali Parkway/<br>Halelo Street   | - Construct an additional eastbound left-turn lane, resulting in a dedicated left-turn lane, shared left-turn/through lane and two (2) dedicated right-turn lanes                                                                                                                                                                          |
| Base Year 2027<br>(Without Project)               | --               | --                                                             | - No roadway improvements recommended                                                                                                                                                                                                                                                                                                      |

Appendix D: Roadway Improvements Summary cont'd

| Buildout Year                       | Project Scenario | Intersection                                                                   | Roadway Improvement                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------------|------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ROADWAY IMPROVEMENTS WITH PULELEHUA |                  |                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                        |
| Future Year 2022<br>(With Project)  | Scenario 1       | --                                                                             | - No additional roadway improvements recommended                                                                                                                                                                                                                                                                                                                                                       |
|                                     | Scenario 2       | Honoapiilani Highway/<br>Akahele Street <sup>1</sup>                           | - Optimize signal timing plan<br>- Northbound left-turn lane → Lengthen lane to provide at least 275 feet of storage space<br>- Southbound left-turn lane → Lengthen lane to provide at least 275 feet of storage space<br>- Westbound left-turn lane → Lengthen lane to provide at least 300 feet of storage space                                                                                    |
|                                     |                  | Honoapiilani Highway/<br>Project Retail Area North<br>RIRO Access <sup>1</sup> | - Northbound right-turn lane → Provide a new right-turn with at least a 100 feet of storage space.                                                                                                                                                                                                                                                                                                     |
|                                     |                  | Akahele Street @<br>Road A & Road C<br>intersections                           | - Consider installing left-turn storage lanes along Akahele Street at Road A and Road C intersections                                                                                                                                                                                                                                                                                                  |
|                                     | Scenario 3       | Honoapiilani Highway/<br>Road J (Project South<br>Access) <sup>1</sup>         | - Provide a median refuge lane along Honoapiilani Highway for westbound left-turn vehicles.<br>- Northbound right-turn lane → Provide a new right-turn with at least a 100 feet of storage space<br>- Southbound left-turn lane → Provide a new left-turn with at least a 100 feet of storage space<br>- Westbound left-turn lane → Provide a new right-turn with at least a 100 feet of storage space |
| Future Year 2027<br>(With Project)  | Scenario 4       | Honoapiilani Highway/<br>Kapunakea Street                                      | - Consider restriping to provide exclusive eastbound left-turn lane and shared through/right-turn lane.                                                                                                                                                                                                                                                                                                |

Notes:

1. Right-turn and left-turn lane lengths show required minimum storage space only. Additional taper length and/or deceleration length to be provided/verified upon intersection design. Based on AASHTO Green Book, 425 feet is recommended to accommodate full deceleration length with a design speed of 50 mph.



---

---

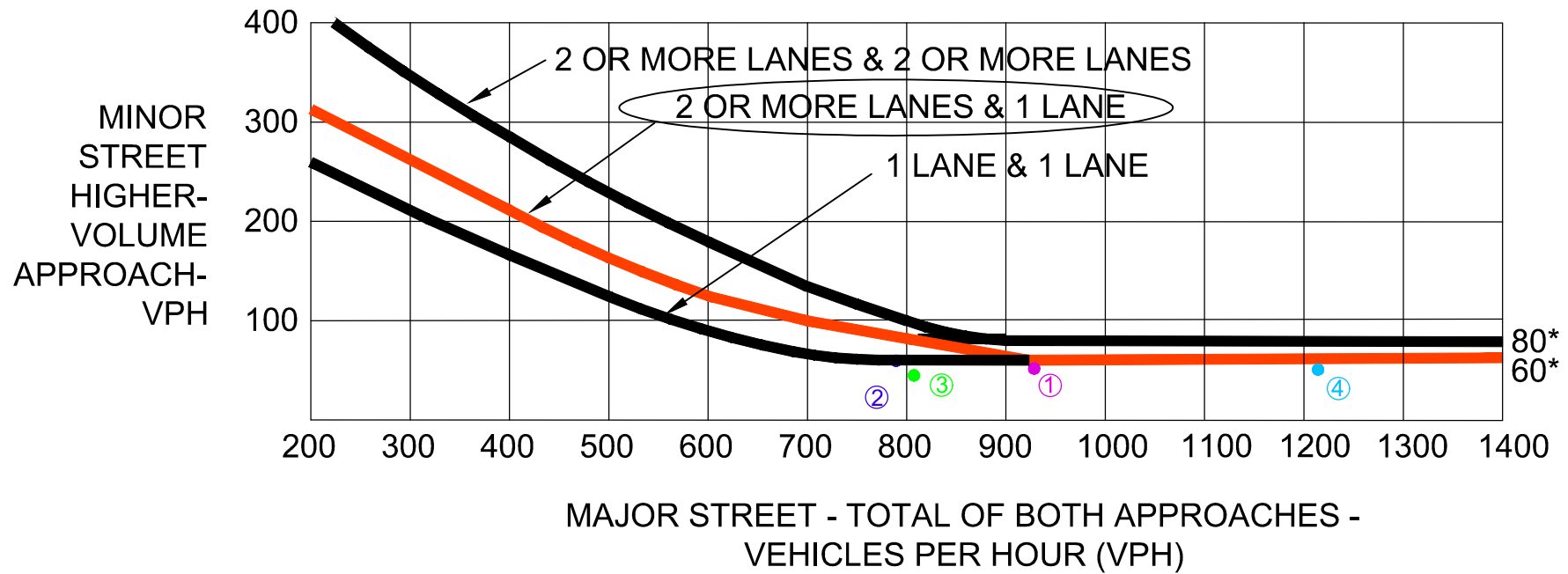
## APPENDIX E

### SIGNAL WARRANT

---

---

## Warrant 2, Four-Hour Vehicular Volume (70% Factor)



\*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

- ① (6:15 AM to 7:15 PM), (925, 57)
- ② (7:15 PM to 8:15 AM), (795, 65)
- ③ (8:15 AM to 9:15 AM), (807, 47)
- ④ (3:45 PM to 4:45 PM), (1210, 55)



AUSTIN, TSUTSUMI & ASSOCIATES, INC.  
ENGINEERS, SURVEYORS • HONOLULU, HAWAII

PULELEHUA

FUTURE YEAR 2027 FOUR HOUR TRAFFIC SIGNAL WARRANT FOR  
HONOAPIILANI HIGHWAY/ROAD J INTERSECTION

FIGURE

1